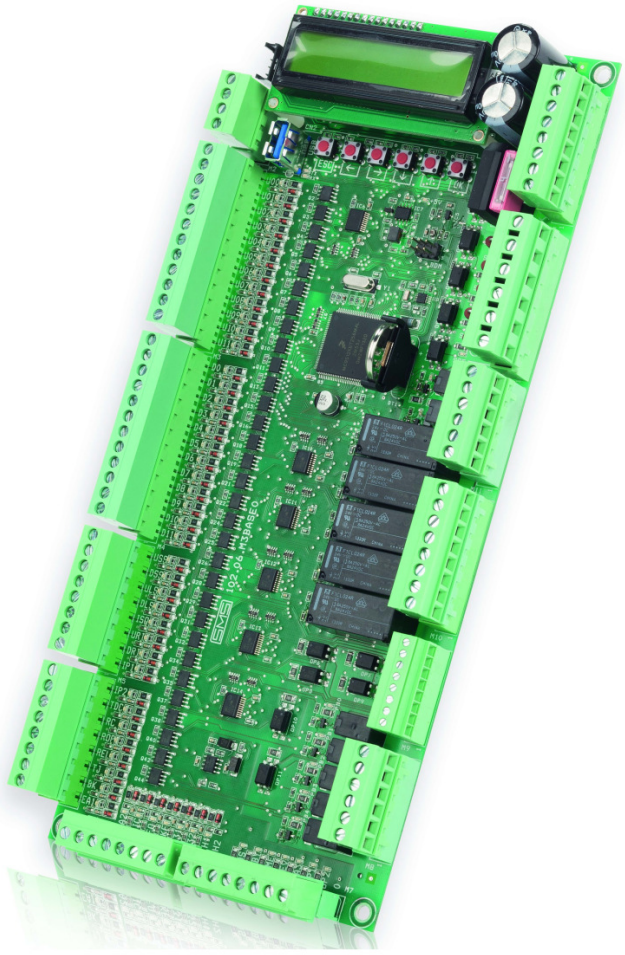
Control Panel Board

ELEMPU

STANDARD VERSION
WITHOUT EXPANSION

USER'S MANUAL



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1 – INTRODUCTION

ELEMPU is a control board for lift operation, designed and constructed by SMS.
Compact and versatile, thanks to the type of integrated functions, it allows minimizing the number of external components to be provided on the control panel.

It is part of ELESYS system, which includes:

- ELEMPU board - BASIC board for the controller, with parallel and serial connection.
- ELEPLUS board - AUXILIARY board for the car or Inputs/Outputs expansion, with serial communication.

This Manual refers exclusively to ELEMPU board, used as the only control board, with parallel connections. In this layout, it is suitable for both hydraulic systems and traction systems, with different types of drives and doors, and for the following types of operation:

- Automatic Push Button (A. P. B.) up to **12** stops
- DOWN COLLECTIVE OPERATION up to **12** stops
- FULL COLLECTIVE OPERATION up to **8** stops

2 – GENERAL SPECIFICATIONS

Dimensions: 120 x 274.6 mm

Application Software installed on the micro controller, upgradeable via PC

System configuration and fault diagnostics using 6 buttons and LCD display (16 characters on 2 rows) installed on the board. The parameters are stored permanently in E^2PROM memory, even in the absence of the supply voltage.

Operating temperature: 0°C ÷ 50°C

The ELEMPU card manages the following types of installation:

► **DRIVES**

- TRACTION LIFT
  - AC 1 speed
  - AC 2 speeds
  - VVVF (OPEN/CLOSE loop)
- HYDRAULIC LIFT
  - Direct Starting
  - Soft Starter Starting
  - HYDROVERT

► **TYPE OF DOORS**

- MANUAL
- SEMIAUTOMATIC
- AUTOMATIC
- PARKING WITH OPEN OR CLOSED DOORS
- SINGLE ENTRANCE

► **OPERATIONS**

- AUTOMATIC RESET TO BOTTOM OR TOP FLOOR AT START-UP
- INSPECTION
- MANUAL CONTROL (for testing and adjustments)
- RELEVELING
- AUTOMATIC RETURN TO A SELECTED FLOOR
- EMERGENCY
- V.I.P. CALL
- FIRE-FIGHTERS OPERATION as per EN81-73

► **CAR POSITION CONTROL SYSTEM**

- MONOSTABLE OR BISTABLE MAGNETIC SWITCHES

► **CONTROLS AND PROTECTIONS**

- MOTOR THERMAL PROTECTION VIA THERMISTORS
- MAXIMUM TRAVEL TIME (separate for HIGH / LOW speed)
- TURNING OFF THE LIGHT IN THE CAR / FAN TIME DELAY

► **STANDARDS AND DIRECTIVES**

-	LIFTS DIRECTIVE	95/16/EC
-	HARMONIZED STANDARDS	EN 81-1 EN 81-2
-	EMC DIRECTIVE	2004/108/EC
-	HARMONIZED STANDARDS	EN 12015 EN 12016

3 – ELECTRICAL SPECIFICATIONS

Board power supply: 18Vac +/- 10% (terminals 18V~ - 18V~ / M13), protected by replaceable fuse 4A.

Inputs / Outputs Power Supply: 24Vdc (terminals 24V – 0V / M13)

Auxiliary Boards Power Supply: 24Vdc (terminals 24E - 0V / M13)

IMPORTANT Do not power the board with voltage different than that specified; moreover, **the negative pole of 24VDC voltage (terminals 0V / M13) must NOT be connected to GROUND**.

INPUTS

The status of each input is indicated by the relative GREEN LED.
NOTE: For the inputs from car and landing call buttons, since they are common with the relative output, the LED is RED

5 Optoisolated inputs for the control of the state of safety circuits (Terminal Block M12)
Allowed voltage: 24 ÷ 110V AC/DC.
These inputs are made in accordance with the HARMONIZED STANDARDS EN81, the negative pole of the voltage that supply the safety chain is the terminal **SCC (M12 and M10), which MUST be connected to GROUND**.

46 Inputs 24Vdc (Terminal blocks M2 ÷ M6) for the signals coming from car and landing call buttons, switches for slowing down and stop, maintenance control box, photocells, etc. (See detailed list in Chapter 5).
All the input circuits are protected against line noises and voltage surges.

1 Input for thermistors, for motor thermal protection (terminals TH1 – TH2 / M6).
Motor thermistors should be directly connected to the board; when the protection is not active, the corresponding green LED is on.

OUTPUTS

The status of each output is displayed by the relative RED LED.

N° 5 Relay Outputs for:
- Motor contactors (Up (UP), Down (DN), High/Low Speed (HS/LS) - Terminal Block M10)
- Occupied signal/Car Light (EC - Terminal Block M11)

Dry contacts are available in the terminal block of the above mentioned relays, which have the following features:

Nominal voltage:	250Vac
Rated load AC15:	400VA
Break power DC1:	110V 0.3 A

Since the commands of motor contactors can be connected downstream of safety circuits, insulation distances comply with the requirements specified in Appendix H of the Harmonized Standards EN81.

7 Relay Outputs for:
- Door controls (1 entrance) (Opening (DO), Closing (DC) - Terminal Block M11))
- Control of Car Position signal in binary code (PB0 ÷ PB4 - Terminal Block M8)

Dry contacts are available in the terminal block of the above mentioned relays, which have the following features:

Switching power:	0.5A/125Vac 1A/30Vdc
Max switching voltage (AC/DC):	125Vac/ 60Vdc

The common terminal of position signal (PB) is voltage free.

24 **Transistor Outputs** for **COMING** or **REGISTERED** signal (Terminal blocks M2 – M3).
Maximum current supplied by each output = **250mA**.
The output transistors are protected against short circuit.

7 **Transistor Outputs** (Terminal block M7), for optional controls such as Out of Service, Next Leaving, Releveling, Emergency, etc.
Maximum current supplied by every output = **250mA**.
The output transistors are protected against short circuit.
The outputs connected to terminal block M7 can be connected directly to external signals or relays, with **24VDC** coil.
The load must be connected between the corresponding terminal and **0V**, as indicated in the example in Fig. 1 for the Out of Service (OS) signal.
Always connect a diode in parallel with the coil of any relay, as indicated in Fig. 1.

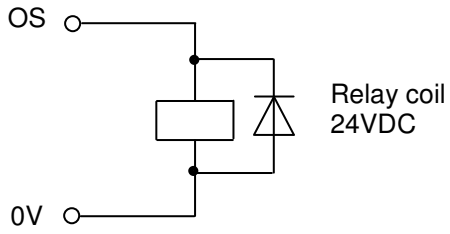


Fig. 1

6 **Outputs with Photocoupler** (Terminal Block M9), for direct commands to the inverter: Up, Down, High Speed, Low speed, Inspection speed, Emergency

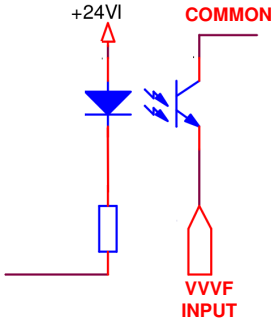


Fig. 2

4 – ELEMPU BOARD LAYOUT

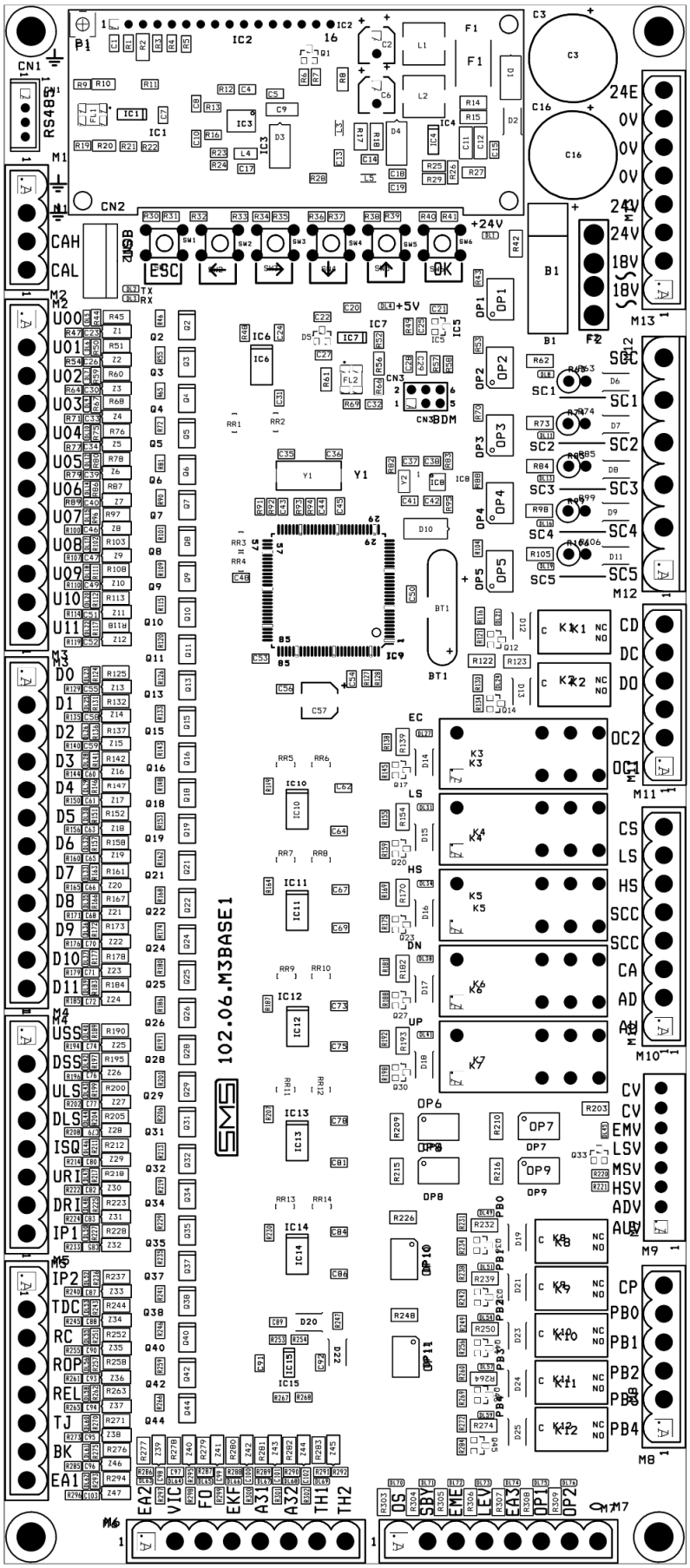


Fig. 3

5 – DESCRIPTION OF CONNECTIONS

INPUTS / OUTPUTS

TERMINAL BLOCKS M2 - M3

LABEL	OPERATION:			
	AUTOMATIC PUSH BUTTON (A.P.B.)		↓DOWN COLLECTIVE	FULL COLLECTIVE
U00	Car and Landing call Floor 0		Car control Floor 0	Up landing call to Floor 0
U01	Car and Landing call Floor 1		Car control Floor 1	Up landing call to Floor 1
U02	Car and Landing call Floor 2		Car control Floor 2	Up landing call to Floor 2
U03	Car and Landing call Floor 3		Car control Floor 3	Up landing call to Floor 3
U04	Car and Landing call Floor 4		Car control Floor 4	Up landing call to Floor 4
U05	Car and Landing call Floor 5		Car control Floor 5	Up landing call to Floor 5
U06	Car and Landing call Floor 6		Car control Floor 6	Up landing call to Floor 6
U07	Car and Landing call Floor 7		Car control Floor 7	---
U08	Car and Landing call Floor 8		Car control Floor 8	---
U09	Car and Landing call Floor 9		Car control Floor 9	Down landing call Floor 1
U10	Car and Landing call Floor 10		Car control Floor 10	Down landing call Floor 2
U11	Car and Landing call Floor 11		Car control Floor 11	Down landing call Floor 3
D0	Car at Floor 0	DECIMAL CAR POSITION Signal (one output per floor)	---	Down landing call Floor 4
D1	Car at Floor 1		Down landing call Floor 1	Down landing call Floor 5
D2	Car at Floor 2		Down landing call Floor 2	Down landing call Floor 6
D3	Car at Floor 3		Down landing call Floor 3	Down landing call Floor 7
D4	Car at Floor 4		Down landing call Floor 4	Car control Floor 0
D5	Car at Floor 5		Down landing call Floor 5	Car control Floor 1
D6	Car at Floor 6		Down landing call Floor 6	Car control Floor 2
D7	Car at Floor 7		Down landing call Floor 7	Car control Floor 3
D8	Car at Floor 8		Down landing call Floor 8	Car control Floor 4
D9	Car at Floor 9		Down landing call Floor 9	Car control Floor 5
D10	Car at Floor 10		Down landing call Floor 10	Car control Floor 6
D11	Car at Floor 11		Down landing call Floor 11	Car control Floor 7

To each CAR and/or LANDING CALL is associated a signal, COMING in the event of A.P.B. operation, or REGISTERED in case of COLLECTIVE operation.

This signal must be connected to the same terminals provided for the buttons, as shown in Figure 4 (only one wire for the connection of button/lamp to the board):

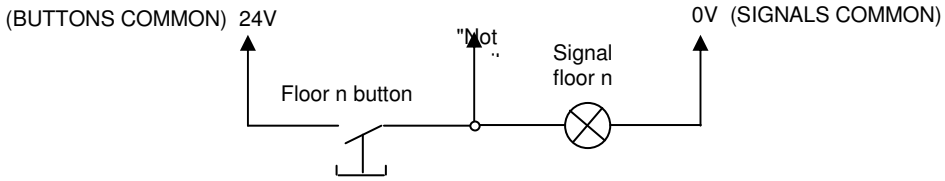


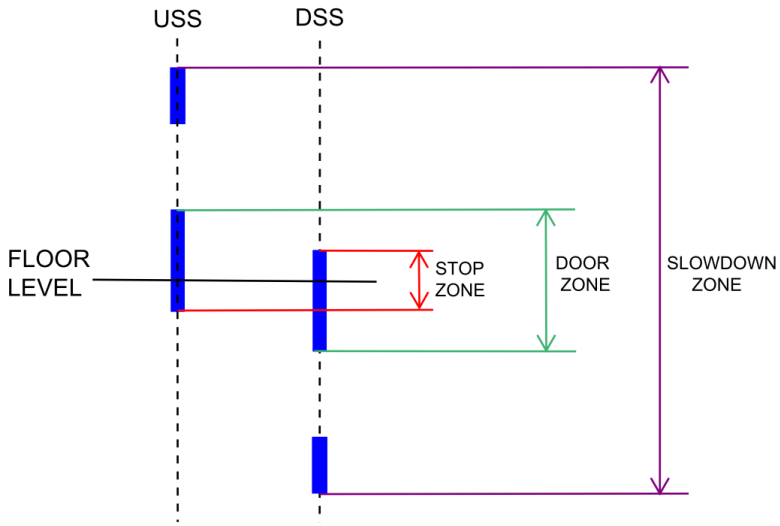
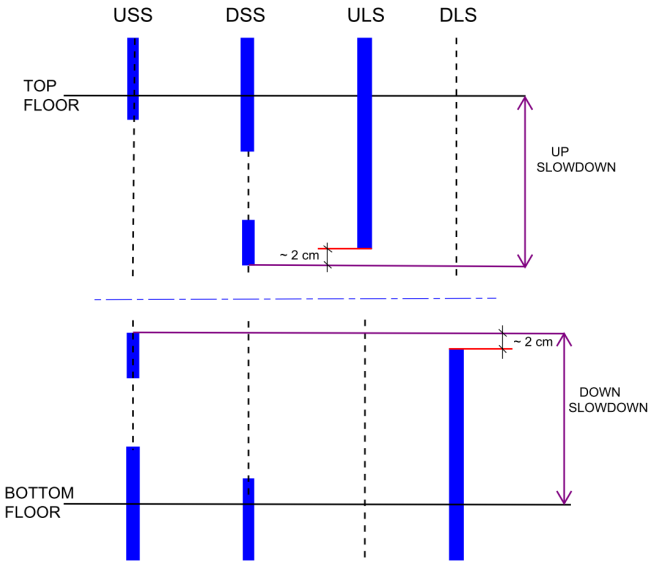
Fig. 4

CAR POSITION signals in decimal code are supplied by 24Vdc (Max load = 250mA) with short-circuit protection.
In case you use a display, this MUST be of NEGATIVE COMMON(common cathode) type.

INPUTS 24Vdc

TERMINAL BLOCKS M4 - M5 - M6

All INPUTS connected to the above terminal blocks are contacts or switches supplied by 24Vdc. Therefore, they must be connected between the common 24V and the corresponding terminal, except for the THERMISTORS input described below.

LABEL	DESCRIPTION
USS **DSS**	UP STOP SWITCH (DOWNWARD SLOWDOWN) DOWN STOP SWITCH (UPWARD SLOWDOWN)  ***Fig. 5*** The contacts of USS and DSS can be of NO or NC type, with appropriate programming. If necessary, for example due to the speed of the system or to the distance between the floors, the magnets that control the slowdown can "cross", i.e. the magnet, which controls the slowdown to the next floor may be positioned immediately after the magnets of floor zone (stop/door zone). No programming is required for the board. The software adjusts automatically. It is however required to provide a distance of a few centimetres between the floor zone magnets and the slow down on, to allow the correct reading of the input (this distance depends on the system speed); usually 5 cm are sufficient, and therefore the **minimum distance between floors** allowed is equal to the **slowdown space + door unlock space + 5 cm**.
ULS **DLS**	TOP FLOOR LIMIT SWITCH BOTTOM FLOOR LIMIT SWITCH The switches ULS and DLS must be of type NC and driven at end floors by a magnet with a length equal to slowdown distance minus 2 cm, as shown in the figure below. 
LABEL	**DESCRIPTION**

ISQ	INSPECTION BOX CONTACT It must be CLOSE with the system in NORMAL service, and OPEN in INSPECTION state. If there are multiple Inspection buttons (on car roof, in the control panel, in the shaft, etc.) the relative contacts must be connected in series.
URI	INSPECTION UP BUTTON
DRI	INSPECTION DOWN BUTTON
IP1	In this configuration ELEMPU assumes the function **PE1** - PHOTOCELL CONTACT It must be CLOSE with beam free, and OPEN with beam interrupted.
IP2	In this configuration of ELEMPU assumes the function **OCI** - CAR SWITCH OVERLOAD (load > 110% loading capacity) Contact CLOSE with car overload. In this configuration the ELEMPU board is not provided with an output for the relative signal, which therefore must be controlled directly by the input, connecting it between IP2 and 0V.
TDC	CONTACTOR DROP-OUT DELAY Active input for VVVF drive only. Connect the output of the VVVF dedicated to the control of the contactors. If not connected, the drop-out of the contactors in VVVF drive is controlled with a delay with respect to the stop command set in parameter F17.
RC	RUN CONTACTORS CONTROL Connect to the auxiliary contacts of contactors that control the motor, where an eventual "sticking" could bring to a dangerous operation. It is possible to program if the input must be active during RUN (contacts N. A. in parallel) or active with car STOPPED (contacts N.C. in series)
ROP	EMERGENCY OPERATION ACTIVATION - See description of operation in Chapter 6.7
REL	RELEVELING ENABLE CONTACT Connect to an auxiliary contact of the SAFETY CIRCUIT which enables releveling with open doors and that provides the door contact by-pass - see Chapter 6.5 .
TJ	NOT USED in this configuration of ELEMPU
BK	In this configuration of ELEMPU it assumes 2 different functions depending on the type of operation, namely: - **EC** - OCCUPIED CAR (load ≥ 1 person) in AUTOMATIC PUSH BUTTON operation (A.P.B.) if CLOSE, it maintains the "OCCUPIED" output active - **FC** - FULL CAR (load > 80% loading capacity) in COLLECTIVE operation if CLOSE, the car starts only to serve the car calls and ignores the landing calls, that remain stored in order to be served at FC opening.
EA1	EXTERNAL ALARM 1 The opening of this input causes the OUT OF SERVICE with immediate stop of the car. It can be connected, for example at the contact of the SUPPLY PHASE CONTROL device or at FAULT contact of the VVVF. When the input is reset close, the lift automatically returns to service with a rephasing operation. Connect a 24V if not used.
EA2	EXTERNAL ALARM 2 The opening of this input causes the car to stop at the end of the current travel. It can be connected for example to the contact of the oil thermostat. Connect to 24V if not used.
VIC	V.I.P. CALL - See description of operation in Chapter 6.8
FO	CONTACT FOR ENABLING FIRE-FIGHTERS OPERATION as per EN81-73. - See description of operation in Chapter 6.9
EKF	NOT USED in this configuration of ELEMPU
A31	In this configuration of ELEMPU it assumes the function **ODB** – DOOR OPENING BUTTON Contact normally closed, the action on the button controls the opening of the doors - connect to 24V if not used.
A32	In this configuration of ELEMPU it assumes the function **CDB** – DOOR QUICK CLOSING BUTTON Enabled for COLLECTIVE operation only
TH1 **TH2**	MOTOR THERMISTORS

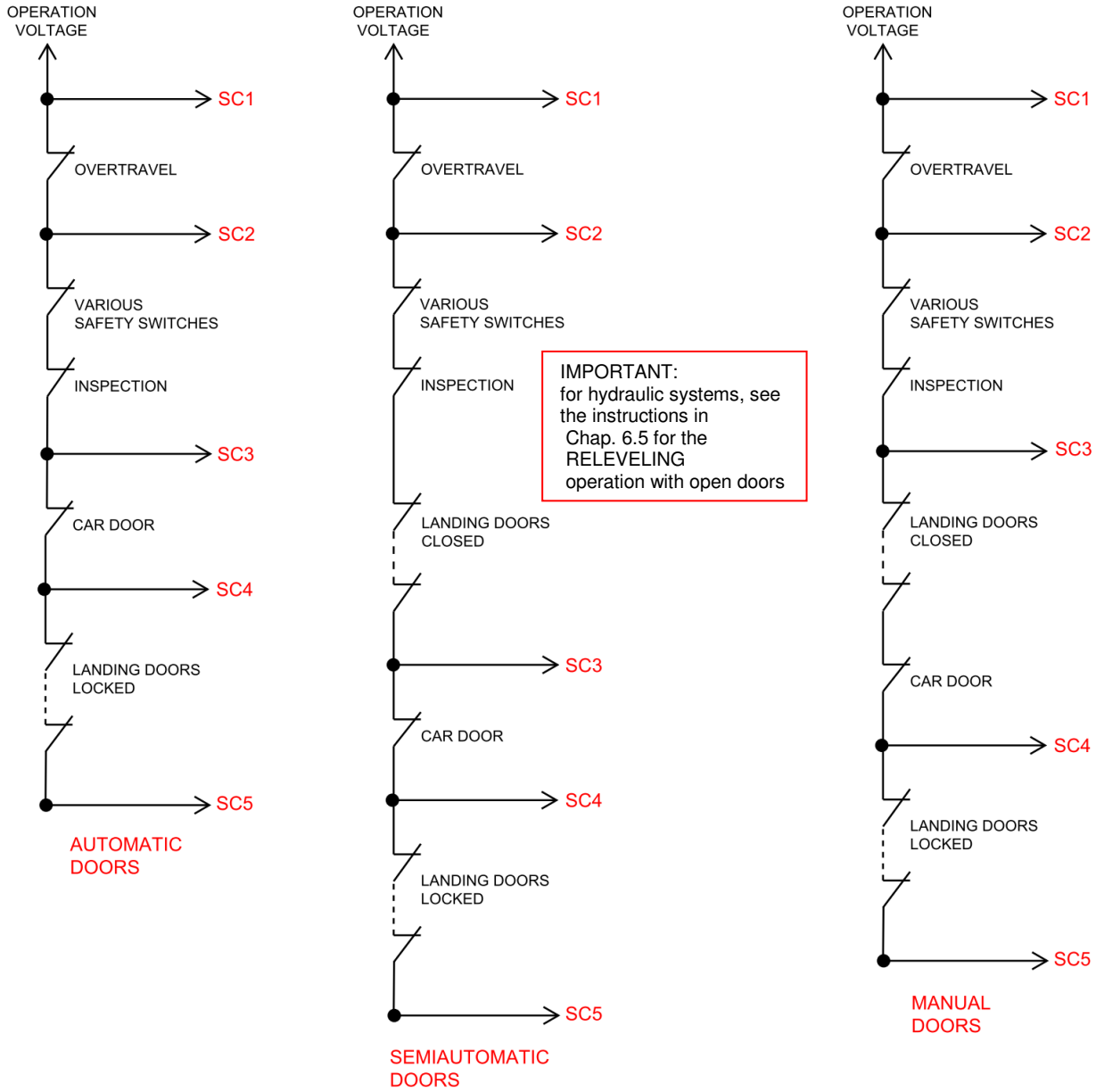
SAFETY CHAIN INPUTS

TERMINAL BLOCK M12

Optoisolated inputs for the control of the state of safety circuits.

LABEL	DESCRIPTION
SCC	VOLTAGE REFERENCE OF SAFETY CIRCUITS GROUNDED on the control panel.
SC1	SAFETY CHAIN BEGINNING downstream of the OPERATIN AUTOMATIC VALVE
SC2	1st SECTION OF SAFETY CHAIN downstream of the OVERTRAVEL switch, that must be the 1st of the series
SC3	2nd SECTION OF SAFETY CHAIN downstream of VARIOUS SAFETY SWITCHES (STOP SWITCH IN THE PIT, OVERSPEED GOVERNOR, OVERSPEED GOVERNOR TENSION DEVICE, SAFETY GEAR, etc.), of the NORMAL SERVICE / INSPECTION SWITCH, of the LANDING DOOR CLOSED CONTACTS (for SEMIAUTOMATIC doors only)
SC4	3rd SECTION OF SAFETY CHAIN downstream of the CAR DOOR CONTACT
SC5	4th SECTION OF SAFETY CHAIN downstream of the LANDING DOOR LOCKED CONTACTS

EXAMPLES OF SAFETY CHAIN CONNECTION FOR DIFFERENT TYPES OF DOORS



RELAY OUTPUTS

TERMINAL BLOCK M10

Direction and speed controls

LABEL	DESCRIPTION
CS	COMMON HIGH/LOW SPEED CONTROLS
LS	LOW SPEED CONTROL
HS	HIGH SPEED CONTROL
SCC	Connect the VOLTAGE REFERENCE OF SAFETY CIRCUITS (connected to GROUND on the control panel) to ensure the insulation between the circuits.
CA	COMMON UP/DOWN CONTROLS
AD	DOWN CONTROL
AU	UP CONTROL

TERMINAL BLOCK M11

Automatic doors and "Occupied" controls

LABEL	DESCRIPTION
CD	COMMON DOOR OPENING/CLOSING CONTROLS
DC	DOOR CLOSING CONTROL
DO	DOOR OPENING CONTROL
OC1	N.O. contact of EC relay
OC2	Assumes a different function based on the type of operation, such as - OCCUPIED SIGNAL in AUTOMATIC PUSH BUTTON (A.P.B.) operation connect an external relay with N.C. contact to disable calls from the floors – see the diagram example in Chapter 8.1. - CAR LIGHT CONTROL in COLLECTIVE operation

TERMINAL BLOCK M8

Commands for CAR POSITION Signal in BINARY code

LABEL	DESCRIPTION
CP	CAR POSITION SIGNALS POWER SUPPLY The CP terminal is voltage free, and must be connected to the supply voltage required by the display.
PB0	BIT0 CAR POSITION DECODING
PB1	BIT1 CAR POSITION DECODING
PB2	BIT2 CAR POSITION DECODING
PB3	BIT3 CAR POSITION DECODING
PB4	BIT4 CAR POSITION DECODING

OUTPUTS WITH PHOTOCOUPLER

TERMINAL BLOCK M9

Commands for VVVF

LABEL	DESCRIPTION
CV	VVVF COMMAND COMMON
EMV	EMERGENCY
LSV	LOW SPEED
MSV	INSPECTION SPEED
HSV	HIGH SPEED
ADV	DOWN RUN
AUV	UP RUN

TRANSISTOR OUTPUTS 24Vdc

TERMINAL BLOCK M7

LABEL	DESCRIPTION
OS	OUT-OF-SERVICE ACTIVE output in normal operation, NOT ACTIVE in out-of-service - It is recommended to control an external relay which has the N.O. contact upstream of the safety chain.
SBY	In this configuration of ELEMPU assumes the function **NDS** – direction (A.P.B. operation) /next leaving (COLLECTIVE operation) DOWN Signal.
EME	SYSTEM IN EMERGENCY
LEV	SYSTEM RELEVELING Control an external relay, where NO contact is placed in series with the contact of the SAFETY CIRCUIT which provides the by-pass of the contacts of the doors - see functional description and example of diagram to Chapter 6.5.
EA3	In this configuration of ELEMPU assumes the function **NUS** - direction (A.P.B. operation) /next leaving (COLLECTIVE operation) UP Signal.
OP1	In this configuration of ELEMPU assumes the function **GONG** - acoustic signal of coming car.
OP2	In this configuration of ELEMPU assumes the function **CAM** – RETIRING CAM control.

POWER SUPPLY

TERMINAL BLOCK M13

LABEL	DESCRIPTION
24E	AUXILIARY ELEPLUS BOARDS POWER SUPPLY
0V **24V**	24VDC SUPPLY FOR INPUTS - OUTPUTS - RELAY - SIGNALS etc.
18V~ **18V~**	18Vac POWER SUPPLY FOR THE BOARD, from external INSULATION TRANSFORMER

6 – MAIN SEQUENCES OF OPERATION

The card ELEMPU manages the **POSITION of the car** by means of switches ULS, DLS, USS, DSS (see Page 8), and the OPERATION of the lift in the different conditions that can occur during service:

- **Automatic service (6.1)**
- **Reset operation (6.2)**
- **Inspection operation (6.3)**
- **Service with manual control (6.4)**
- **Releveling (6.5)**
- **Automatic return to a floor (6.6)**
- **Emergency operation (6.7)**
- **V.I.P. call (6.8)**
- **Fire-Fighters operation as per EN81-73 (6.9)**

6.1 - AUTOMATIC SERVICE

This is the regular service of the system.
It completely manages the operating logic of the lift, which can be Automatic Push Button (A.P.B.) operation, Down Collective, Full Collective.

At starting, the board checks, via the RC input, that none of the contactors that contribute to the travel of the car has remained "sticked".

The starting sequence is then initiated by activating first the closing of any automatic doors. Door closing is allowed only if all reopening devices (photocell, safety edge, door opening button) are not activated.

The board is informed when doors are closed by the closing of the car door contact (safety input SC4); there is no input for the door closing limit switch, which must be connected, if present, in series with the closing contactor coil.

When doors are closed, with a small delay to allow for the complete mechanical closing, the CAM output is enabled to activate any retiring cam; subsequently, after input SC5 closing (landing door locked), the actual starting is commanded, and, except for special cases, it always takes place at high speed, i.e. with the activation of the outputs AU (up) or AD (down), and HS (high speed) at the same time.

The lift slows down by opening HS and activating the LS output (low speed).

The stop at floor takes place by opening LS. The opening of AU/AD may be simultaneous with LS (for 2-speeds or hydraulic systems), or it can be appropriately delayed for systems with VVVF drive. The delay can be programmed through an internal timer (see Chapter 8.5 – Function F 17), or you can use the contact to control contactors present in the VVVF drive, if provided: by connecting this contact (which must close during the travel and open with delay upon floor stop) at the TDC input, the opening of the AU/AD relay (and therefore of motor contactors) will be controlled by VVVF.

When motor contactors are switched off, if the car is in the "door zone", i.e. , if at least one of the two switches USS and DSS is engaged, is commanded the opening of the automatic doors: there is no input for door opening limit switch, which must be connected, if present, in series with the opening contactor coil. The door opening control of the board turns off after the time set by the function F22 (see chapter 7.5), so it is important that this time is quite close to the actual time of opening, with a margin of at least one second.

6.2 - RESET OPERATION

The reset operation is carried out automatically by bringing the car to an end floor every time the supply voltage is restored, or when returning to normal operation after inspection operation or after some alarm (such as the maximum travel time or motor protection with thermistors, etc.) has tripped.

During reset, the position of the car is not defined, therefore at this stage on display appears the message "Floor: --".

Reset is carried out in different ways, depending on the position of the car and the type of drive provided:

- Car outside the slowdown area to bottom floor: it starts in down direction at high speed and stops when the switch DLS opens (1 speed lift) or slows down when DLS opens and stops with the opening of USS and DSS (for all the other types of drives).
- Car approaching the bottom floor area but not at floor level:
  - 1 or 2 speed lift systems: it starts moving up at high speed and stops when switch ULS opens (1-speed lift) or slows down when ULS opens and stops with the opening of USS and DSS (2 speed lift).
  - Hydraulic system or with VVVF drive: it starts moving down at low speed and stops at bottom floor when switches USS and DSS open.

When the car stops at the end floor and opens the doors, the car position is set in correspondence with the end floor reached.

The position of the car is reset even during the normal service, every time the car reaches an end floor, where it is always forced to slow down.

6.3 - INSPECTION OPERATION

During the inspection operation, the maintenance worker on car roof controls its movement in “dead man” mode (with permanent pressure of the push-buttons).

The board detects the status of the inspection switch via the input ISQ (ISQ = 0 → inspection service active) and controls the movement when inputs URI (up) or DRI (down) are activated via a contact of the inspection buttons.

Inspection run can be programmed at high or low speed, if the drive is VVVF it is always commanded a medium speed level.

Returning to normal service, a reset operation is performed, with a consequent updating of the car position.

6.4 - MANUAL CONTROL SERVICE

In the manual control service, the maintenance worker can control the movement of the car from the control panel, while normal calls and the opening of the doors are disabled.

The service is activated through the keys on the board, by selecting on the display the menu
2) MANUAL MODE (see Chapter 7 for how to access), with the car stopped at floor level.

The keys ↑ and ↓ control (up and down respectively) the starting of the car, which moves at high speed as long as the button is pressed.

When the button is released, the car keeps on moving at high speed until it reaches the first slowdown zone, where slows down and stops at the corresponding floor.
If the button opposite to the direction of travel of the car is pressed (e.g. key ↓ with car moving up), the lift stops immediately.

To return to automatic operation, you must press the ESC key.

6.5 - RELEVELING

It is the operation that allows the cabin to return within the stop zone, both in up and down direction.

In the control panel should be provided a SAFETY CIRCUIT (CS) that allows bypassing door contacts when the car is located within the release area of the same, to enable the releveling operation with the doors open.

The two inputs of the SAFETY CIRCUIT can be controlled by additional 2 switches operating in the door zone, or by a single additional switch (IZS) as shown in the figure, and two relay contacts operated by USS and DSS in parallel.

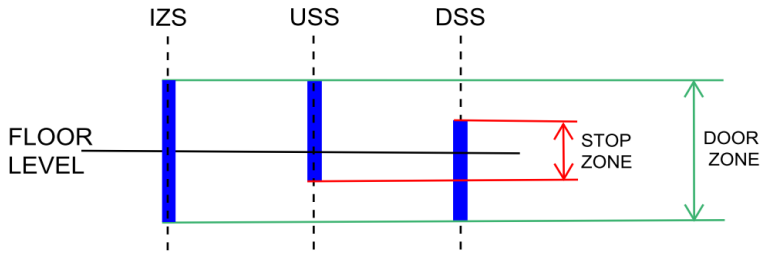


Fig. 8

The board controls the releveling:

- if the car is located within the stop zone;
- if REL input, which is connected to an auxiliary contact of the safety circuit CS, is active;
- if the car drops below USS, keeping the DSS engaged, the UP command is activated;
- if the cabin rises above DSS, keeping the USS engaged, the DOWN command is activated;

The movement is controlled at low speed if the drive is 2 SPEEDS or HYDRAULIC (without VVVF) drive, while if the drive is with VVVF, a different level of speed, programmable on the VVVF itself, is commanded.

Upon the activation of the control of direction and speed, output LEV is also activated; the latter should control an external relay, with N.O. contact connected in series with the contact of the SAFETY CIRCUIT CS that provides for the by-pass of the contacts of the doors - see example in the diagram in Figure 9.

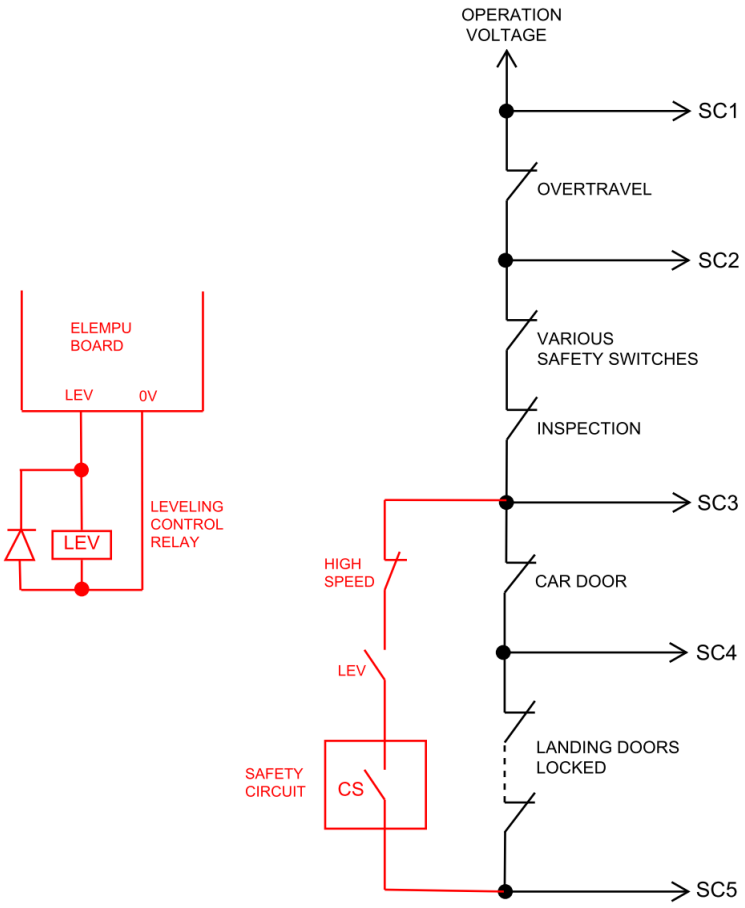


Fig. 9

The releveling operation is disabled in INSPECTION and EMERGENCY operation and also when the safety input SC3 is open, but it remains active while out of service because of the stored opening of the OVERTRAVEL switch (safety input SC2), on the condition that the overtravel switch has closed in the meantime.

In the hydraulic systems with semi-automatic doors, to enable releveling with doors open, the safety chain SC3 should not be interrupted with the landing door closed switches (as shown in the example at page 10).
SC3 must be connected upstream, but to prevent from the automatic car doors closing with the landing doors open, it is required to connect a relay after the previous contacts, connecting a dedicated N.O. contact in series to the input of the photocell (IP1).

6.6 - AUTOMATIC RETURN TO A FLOOR

The car return to a floor is controlled when the car has no command active, after a preset time (maximum 15 minutes); such control is different for TRACTION lifts (1 speed, 2 speed or VVVF), or HYDRAULIC.

In the case of TRACTION lifts, return should be programmed, to the floor which must also be programmed.

For HYDRAULIC systems instead, car return is ALWAYS commanded to BOTTOM FLOOR.

The return is activated automatically only during normal operation; if during return is recorded a call, the return condition is cancelled, and the call is served, stopping, if needed, at the first floor reached, and reversing the direction of travel.

When the car stops to the commanded floor, the doors are not opened.

6.7 - EMERGENCY OPERATION

The emergency operation for bringing the car to the floor in the absence of mains voltage, is activated by the closing of ROP input and the operation differs in the case of TRACTION lift (1 speed, 2 speed, or VVVF), or HYDRAULIC

a) Hydraulic lifts: After 5 seconds from ROP activation, the car moves down to the lowest floor. When reaching the floor, automatic doors, if provided, open and after full opening of the doors any other operation is prevented until the input ROP returns to OFF state; subsequently, the lift returns to service by performing a reset operation.

b) Traction lifts: After 5 seconds from the activation of ROP, the board commands the car to go down: it is not possible to know the direction in which the car will move because it depends on the load, but the speed will certainly be reduced because it is controlled by an emergency inverter.
The lift stops, without slowing down, in the first stop zone reached by the car (i.e., when USS and DSS are both active), the automatic doors open and after doors opening any other operation is prevented until the input ROP returns to OFF state; subsequently, the lift returns to service by performing a reset operation.

6.8 - V.I.P. CALL

The V.I.P. call floor is provided with a key switch (VIC input).
When the key is inserted (VIC = ON), all commands and the existing calls are cancelled, and it is no longer possible to enable other commands.

The car reaches as fast as possible the preset V.I.P. call floor, namely:

a) if the car is stopped, it immediately moves to the V.I.P. call floor.

b) if the car is moving in the same direction as that required by V.I.P. call, it keeps on moving until reaching the V.I.P. call floor.

c) if the car is running in the opposite direction to that requested by V.I.P. call, it slows down and stops at the first floor reached, without opening the doors and, after 2 seconds, it starts moving in the opposite direction to serve the V.I.P. call.

When the car reaches the desired floor, the VIC key is removed and the system returns to normal operating conditions.

By Automatic Push Button (A.P.B.) operation, the " V.I.P." user has, however, priority for a few seconds, to make his command.

By COLLECTIVE operation, the car should be provided with a second key switch in the car that simulates the status of "full car" (FC) input: in this way the car does not stop to serve any other external calls until the "V.I.P." user reaches the desired floor.

6.9 - FIRE-FIGHTERS OPERATION AS PER EN81-73

The fire-fighters operation can be performed in 2 ways:

1) Behaviour in the event of a fire (EN81-73); the relative requirements apply to all types of lifts.
2) Fire-fighter lift operation commanded by fire fighting team (EN81-72).

In this configuration of ELEMPU is provided only the operation in accordance with EN81-73.

There is a function for determining the functionality of the FIRE-FIGHTERS OPERATION:
- if programmed "NONE", the FO input is not considered;
- if programmed "EN81-73 ", the fire-fighters operation in accordance with EN81-73 is enabled.

A contact, which can be a key switch to fire-fighters floor or the contact of an automatic fire detection system, is used as a request for FIRE-FIGHTERS OPERATION connected to the FO input.

The state of the input must be ON with operation INACTIVE (N.C. contact).

Upon operation activation, the car reaches as fast as possible to fire-fighters floor, suitably programmed. In particular:

a) if the car is stopped, it immediately starts moving to the fire-fighters floor.

b) if the car is running in the same direction as that requested by the fire-fighters operation, it keeps on moving until reaching the fire-fighters floor.

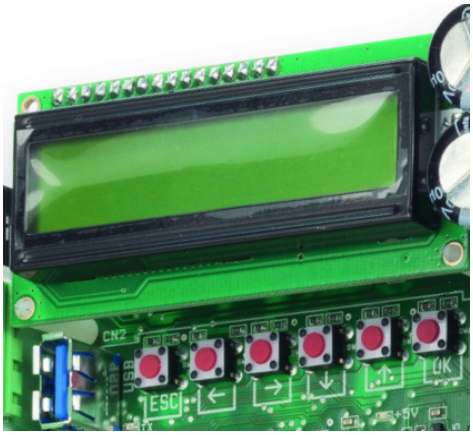
c) if the car is running in the opposite direction to that required by the fire-fighters operation, it slows down and stops to the first floor that reaches, without opening the doors and starts again in the opposite direction toward the fire service floor.

Upon floor stop, the automatic doors open and the elevator remains at a standstill with the doors open and out of service.

In the event of a return of the inputs that activate the normal operating conditions, the lift can return to normal operation only if it has been brought back to the fire brigade floor from which the operation has been activated.

7 – DIAGNOSTICS AND PROGRAMMING

On the ELEMPU board is installed **an LCD DISPLAY** (16 characters on 2 rows)
and **6 KEYS** (**ESC, ←,→,↓,↑, OK**).



During the operation, the display shows a "STATUS PAGE", which shows the operating status of the system.
In the STATUS PAGE is always displayed :

- The FLOOR, which will be indicated with ' --' in the case of reset.
- The STATE of the lift, for example:
  - Normal Operation (AUTO)
  - Manual Service Control (MAN)
  - Reset (RES)
  - Inspection (INS)
  - Emergency (EME), etc.
- The SUBSTATE, namely the current operation of the lift such as:
  - Direction and Speed Level
  - Door Opening (Closing)
  - Door Open (Closed)
  - Releveling, etc.

Examples of status pages

On EleSys V01.00 by SMS s.r.l.	Rephasing Floor:-- RES. Run Down HS
Doors closing Floor:08 AUTO Door closing	Direction and Speed Level Floor:03 AUTO Run Down HS
Doors open Floor:03 AUTO Door OPEN	Inspection Floor:-- INS. Run Up MS

Key Functions

KEY	FUNCTION
OK	Enters the Programming / Diagnostics mode or Confirm the value of the newly modified function.
↑	Go to the next function or increase the value of the selected function.
↓	Go to the previous function, or decrease the value of the selected function.
←	Cancel a change before you press ENTER, or Move the cursor to the left to the desired digit, for changing it.
→	Start changing a function or Move the cursor to the desired digit for changing it.
ESC	Exit the Programming / Diagnostics mode.

Press the OK button with the lift stopped to go to **MENU** page selected, if they are no active priority operations such as inspection, emergency, fire-fighters operation, out of service.

Selection menu

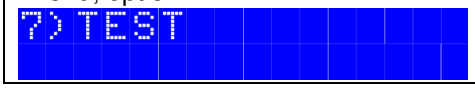
The selection menu shows a numeric index and a description of the corresponding option.

Menu, options 1 and 2

Menu, options 3 and 4

Menu, options 5 and 6

Menu, option 7



By scrolling through the menu using the keys 🡻 and 🡹, the index will flash, with the **OK** button you can select the desired option.

When accessing the menus

3) COUNTERS - 4) ACCESS – 5) FUNCTIONS - 6) SETTINGS - 7) TEST

on the display appears the message "**A 01: Access Code 1**" and on the bottom row is proposed the 8-digit code flashing "**00000000**".

To proceed, you must enter the correct numeric access code, consisting of 8 decimal digits, each of which can assume a value from 0 to 9 .

SMS supplies the ELEMPU boards programmed with **Access Code = 00000000**. The user can choose to modify it as needed after the first access (See 7.4 - ACCESS).

To enter the code, use keys 🡸,🡺,🡻,🡹 as described in the preceding Table "Key Functions".

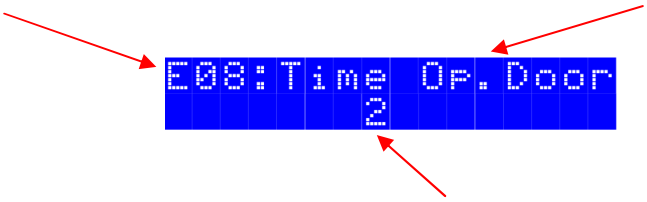
If the code is not correct, after you have confirmed with **OK**, the value entered keeps on flashing on display until the correct code is entered. To return to normal operation, press **ESC**.

If the code is correct, it is possible to access the MENU.

7.1 - DIAGNOSTICS

By accessing this mode, on display is shown the total number of stored alarms:

If there are one or more alarms, press **OK** to display the numeric code of the first alarm (E--), followed by a brief description,



while in the bottom row of the display is shown the number of times that the alarm has tripped:

Pressing 🡹 again you go to the next alarm.
If there is no other alarm, the first alarm will be displayed.

By pressing the keys 🡸 and 🡺 simultaneously, you will clear all the alarms present.

To exit the DIAGNOSTICS mode, press **ESC**.

If an alarm occurs, causing the lift to go in OUT OF SERVICE mode, the display automatically shows the alarm code, that flashes until normal operation is restored:

Press **OK** on this page and then keys 🡸 and 🡺 to clear the alarm and restore the operation of the lift system.

The various alarm codes are summarized in the following TABLE 1 – ALARM CODES.

TABLE 1 – ALARM CODES

ALARM CODE		DESCRIPTION	CONSEQUENCES
E 02	FAILURE TO CLOSE LANDING DOOR LOCKED SWITCHES	Upon leaving, with the doors fully closed (input SC4 active), the input SC5 is not activated within 5 seconds. The description of the alarm E02 is completed with the number of the floor where the alarm has occurred.	A.P.B. OPERATION The call is cancelled, the doors will reopen and the car is waiting for a new call. COLLECTIVE OPERATION The car and landing calls remain recorded and 5 attempts will be performed: if the problem persists, all calls are cancelled and the car remains in service, waiting for new calls. MULTIPLEX OPERATION The calls are not cancelled but are transferred to the other cars.
E 03	FAILURE TO ACTIVATE MOTOR CONTACTORS	Upon leaving, with locked doors (input SC5 active), input RC is not activated within 2 seconds. The description of the alarm E 03 is completed with the number of the floor where the alarm has occurred.	
E 05	CAR DOES NOT MOVE	Upon leaving, after the closing of contactors, the car does not move out from the stop zone within 10 seconds. The description of the alarm E 05 is completed with the number of the floor where the alarm has occurred.	
E 06	RESET FAILURE	The car is unable to complete the reset operation. (arrival at the end floor and doors opening).	The system waits for a next call to try again the reset operation.
E 07	CAR DOORS FAIL TO CLOSE	The doors do not complete the closing (SC4 = ON) within the time set in F 23.	The call is cancelled, the doors will reopen and the car is waiting for a new call. COLLECTIVE OPERATION The car and landing calls remain recorded and 5 attempts will be performed: if the problem persists, all calls are cancelled and the car remains in service, waiting for new calls. MULTIPLEX OPERATION The calls are not cancelled but are transferred to the other cars. If the timer intervenes in the CLOSING FOR PARKING or RESET procedure, 5 closing attempts will be performed, after which the car will park with the doors open.
E 08	CAR DOORS FAIL TO OPEN	The doors do not complete the opening within the time set in F 22.	Door motor control is disabled and the lift normally remains in service.
E 09	HIGH SPEED MAXIMUM TRAVEL TIME TRIGGERED	The car is moving at high speed without reaching the next floor within the time set in F 24.	The lift is set to OUT OF SERVICE. Service is restored only after a manual RESET to be performed using the keys ← and →.
E 10	LOW SPEED MAXIMUM TRAVEL TIME TRIGGERED	The car moves at low speed without reaching the floor within the time set in F 25.	The lift is set to OUT OF SERVICE. Service is restored only after a manual RESET to be performed using the keys ← and →.
E 11	RELEVELING MAXIMUM TRAVEL TIME TRIGGERED	The car is in releveling phase without reaching the floor within the time set in F 50.	The lift is set to OUT OF SERVICE. OS output is disabled. Service is restored only after a manual RESET to be performed using the keys ← and →.
E 12	FAILURE TO DEACTIVATE CONTACTORS	The RC input (RUN contactors) do not turn off within 2 seconds from deactivation command (deactivation of outputs AU / AD).	Subsequent leaving is prevented for the entire time in which RC remains active.

ALARM CODE		DESCRIPTION	CONSEQUENCES
E 13	FLOOR COUNT ERROR	Car position indicates an end floor but no limit switch is active.	A call is made to the opposite end floor to reset the car position.
E 14	OVERTRAVEL	Opening of overtravel switch (input SC2 - 1st section of safety chain)	The lift is set to **OUT OF SERVICE**. Service is restored only after a manual RESET to be performed using the keys ← and →.
E 15	MOTOR THERMISTORS PROTECTION TRIGGERED	Motor thermistors (connected to the input TH1 - TH2) have detected a rise in motor temperature up to the threshold of protection.	The car stops with the mode defined by F 33, then the elevator is set to **OUT OF SERVICE**. OS output is disabled. Service can be restored in AUTOMATIC or MANUAL mode (depending on how F12 is set), performing the reset procedure.
E 16	EXTERNAL ALARM 1	The contact connected to the input EA1 is open (for example the alarm contact of the VVVF).	The lift is set to **OUT OF SERVICE**. OS output is disabled. Normal operation is automatically reset when the contact closes, performing the reset procedure.
E 17	EXTERNAL ALARM 2	The contact connected to the input EA2 is open (for example, the contact of the oil thermostat).	The lift stops at the end of the current travel and a subsequent leaving is prevented. Normal operation is automatically reset when the contact closes.
E 18	NO OPERATING VOLTAGE	There is no voltage at the input SC1 (upstream of the safety chain)	The lift stops and a subsequent leaving is prevented. The lift returns the service automatically when the voltage is restored.
E 20	MAXIMUM TIME PHOTOCELL OR SAFETY EDGE INTERRUPTED	Contact connected to the input IP1 is open for a time greater than 20 sec.	Leaving is prevented as long as such condition is active. Normal operation is automatically restored when the contact closes.

7.2 - MANUAL MODE

Provides access to the MANUAL CONTROL SERVICE, see Chap.6.4 .

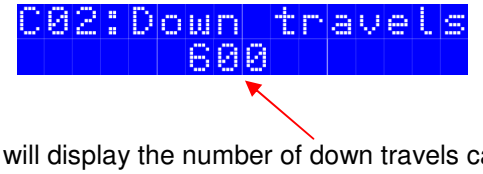
7.3 - COUNTERS

In this mode, the status of 4 counters is displayed, providing information relating to the operation of the lift system.

The counters displayed are:

C 01	Number of up travels
C 02	Number of down travels
C 03	Number of door openings
C 04	Number of door closings

EXAMPLE:



By selecting for example C02, you will display the number of down travels carried out by the lift:

The number is incremented every 100 travels and for this reason the value displayed is always a multiple of 100.

To reset the count, press both buttons ← and → simultaneously.

7.4 - ACCESS

In this mode, you can customize the **Access Code** (after entering the currently valid code) and change the language (**Italian or English**).

As already specified, SMS supplies the ELEMPU boards programmed with **Access Code = 00000000**.

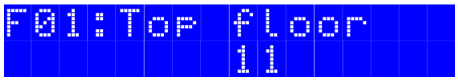
Be careful to keep the access code, if you changed the default factory setting.

To change the code, use the keys ←,→,↓,↑ as described in the Table "Function of the keys" and confirm with **OK**

7.5 - FUNCTIONS

This mode allows configuring the ELEMPU board, i.e. to insert the specific data of the lift, choose the desired options among those available, and modify the preset times, if needed.

This can be done using 50 FUNCTIONS (from F01 to F50), described in detail in the following TABLE 2 - FUNCTIONS FOR SYSTEM CONFIGURATION.



Example F01: Top Floor
Sets the number of lift stops (Top Floor - 11).

The functions can be selected by scrolling through the menu using the keys ↓ and ↑ .

The selected function can be changed as follows:

- Press → , the current value of the function flashes on the bottom line of the display.
- Use keys ↓ or ↑ to increase or decrease the value of the function.
- Use keys ← or → to go to the next or previous digit of the function, if it is a function of a numeric type.
- When the function assumes the desired value, press **OK** to save it or press ← to exit without saving the change.

TABLE 2 - FUNCTIONS FOR SYSTEM CONFIGURATION

FUNCTION F		ALLOWED VALUES AND MEANING	DEFAULT
F 01	TOP FLOOR	1 ÷ MAX F. MAX F. = 11 for A.P.B. operation = 11 for DOWN COLLECTIVE operation. = 8 for FULL COLLECTIVE operation	11
F 02	MAIN FLOOR	0 ÷ MAX F. It is used to properly manage calls from floors in case of DOWN COLLECTIVE operation, when the main floor does not coincide with the bottom floor.	0
F 03	LIFT OPERATION	- A.P.B. Automatic Push-Button Operation - DOWN COLLECTIVE - FULL COLLECTIVE	UNIVERSAL
F 04	DRIVE TYPE	- 1 SPEED - 2 SPEEDS - VVVF - HYDRAULIC	2 SPEED
F 05	DOOR TYPE	- MANUAL both in the car and at landing - SEMIAUTOMATIC automatic doors in the car and manual doors at landing - AUTOMATIC both in the car and at landing	AUTOMAT.
F 06	DOOR AT FLOOR	- OPEN DOORS - CLOSED DOORS	DOORS CLOSED
F 07	CAR ENTRANCES	- 1 - 2	1

FUNCTION F		ALLOWED VALUES AND MEANING	DEFAULT
F 08	DOOR OPENING P0 DOOR OPENING P1 DOOR OPENING P2 . . . . DOOR OPENING MAX F.	- SIDE 1 open side 1 door only - SIDE 2 open side 1 door only - SIMULTAN. open both side 1 and 2 doors simultaneously - SELECTIVE - NONE to be used, for example, for entrance with manual doors	SIDE 1
F 09	INSPECTION SPEED	- LOW - HIGH	LOW
F 10	FORCED DOOR CLOSING	- NO - YES DOOR CLOSING control remains active while the lift moving	NO
F 11	CALLS CANCELLATION	- SELECTIVE when reaching a floor it cancels only the call with the same car direction - SIMULTANEOUS when approaching a floor, it always cancels both up and down calls Valid only for FULL COLLECTIVE operation.	SELECTIVE
F 12	THERMISTORS ALARM RESET	- MANUAL the operation is prevented until manual reset - AUTOMATIC the operation is restored automatically after 10 minutes from thermistors return to normal status	MANUAL
F 13	AUTOMATIC RETURN	- NO - YES Valid only for the traction lifts; for the hydraulic systems the return to bottom floor is always enabled.	NO
F 14	AUTOMATIC RETURN FLOOR	0 ÷ MAX F. Valid only if the previous F 13 = YES	0
F 15	V.I.P. CALL FLOOR	0 ÷ MAX F. Floor that must be reached by the car in response to activation of the VIC input (see Chapter 6.8)	1
F 16	STOP DELAY	0,0 ÷ 2.0 sec. It is the delay time between the opening of the stop switch and the actual stop of the car. By taking advantage of this delay it is always possible to have the same stop zone, regardless of the type and the speed of the lifts system.	0
F 17	CONTACTORS OPENING DELAY	0,0 ÷ 2.0 sec. Valid only for VVVF drive, when TDC input is not used	2,0
F 18	EMERGENCY STOP DELAY	0,0 ÷ 2.0 sec. It is the equivalent of F 16 for "emergency" operation.	2,0
F 19	RETIRING CAM DROP DELAY	0,0 ÷ 2.0 sec. It is the delay time between the opening of the contactors and the opening of the relay which controls the retiring cam (CAM) It can be useful, for example, in lifts with 1-speed drive, to control the cam drop when the car is already stopped (at the end of the braking).	0,3
F 20	DOOR OPENING DELAY	0,0 ÷ 2.0 sec. It is the delay time between the opening of the contactors and command for door opening It can be useful for example in lifts with automatic doors and retiring cam to ensure that the doors begin to open when the cam has already dropped.	0,5
F 21	MAXIMUM EMERGENCY TIME	1 ÷ 15 minutes If the emergency procedure is not completed within this time, it will be interrupted; to restore the operation you need to disable the ROP input.	15
F 22	DOOR OPENING TIME	1 ÷ 60 sec. Protection of the door motor for opening; set a time 1 second higher than the time normally required to fully open the doors.	5
F 23	DOORS CLOSING TIME	1 ÷ 60 sec. Protection of the door motor for closing; set a time a few seconds higher than the time normally required to fully close the doors.	20

FUNCTION F		ALLOWED VALUES AND MEANING	DEFAULT
F 24	MAX. TRAVEL TIME HIGH SPEED	1 ÷ 45 sec. It does not depend on the travel of the lift because it starts from 0 at every passage from a floor.	45
F 25	MAX. TRAVEL TIME LOW SPEED	1 ÷ 45 sec.	45
F 26	START DELAY TIME	1 ÷ 60 sec. Valid only for COLLECTIVE operation. It is the stop time of the car at floor with the doors open before the next leaving due to a command or existing call.	2
F 27	OCCUPIED TIME	1 ÷ 60 sec. In the A.P.B. operation this is the classic delay that controls the "OCCUPIED" signal and disables calls from landing control stations. In COLLECTIVE operation, this is the stop time of the car at floor with the doors open before reversing direction to serve calls in the opposite direction. It must be greater than the time set in F 26.	5
F 28	AUTOMATIC RETURN ACTIVATION DELAY	1 ÷ 15 minutes Valid for both traction and hydraulic lifts.	15
F 29	GONG ACTIVATION TIME	0.1 ÷ 3.0 sec. It is the time during which is active the acoustic signal of car coming at floor, at the beginning of door opening, or after the stop in the case of manual doors.	0,5
F 30	FAN / CAR LIGHT TIME	1 ÷ 255 sec. Controls the LC output and determines how long this output must remain active after the “Occupied” state is off.	10
F 31		0 UNUSED	0
F 32	TYPE OF MAGNETIC SWITCHES	- NORMALLY OPEN N.O. contact - NORMALLY CLOSED N.C. contact Refers to the magnetic switches USS and DSS for floor count and stop, the limit switches ULS and DLS must always be NORMALLY CLOSED (N.C.)	NORMALLY CLOSED
F 33	THERMISTORS STOP	- END RUN - IMMEDIATE STOP Defines the stop mode of the car following a THERMISTORS Alarm, or at the end of the travel or immediate stop.	IMMEDIATE STOP
F 34	RELEVELING STOP DELAY	0,0 ÷ 2.0 sec. It is the equivalent of F 16 for "releveling" operation.	0,0
F 35	NEXT CAR LEAVING DIRECTION SIGNAL	- OFF during TRAVEL - ON during TRAVEL Valid only for COLLECTIVE operation, in the first case, the signal is active from the stop at floor until the next leaving, in the second case it remains even during the travel, indicating the direction of travel.	OFF during TRAVEL
F 36	EMERGENCY FLOOR	0 ÷ MAX F.	0
F 37	CONTACTOR INPUT TYPE (RC)	- ACTIVE HIGH connection to RC: N.O. contacts in parallel of the contactors - BOTTOM ACTIVE connection to RC: N.C. contacts in series Choose the control logic of the contactor control according to the availability of auxiliary contacts.	TOP ACTIVE
F 38	CONTACTOR INPUT MODE (RC)	- UP & DOWN control is always done, both in up and down run - UP ONLY the control is made only during up run The function UP ONLY is required for the hydraulic systems where there is no relay/contactor for down run, as the down valve is controlled downstream of the safety chain.	ALWAYS
F 39	LIFT GROUP	- SIMPLEX - DUPLEX - TRIPLEX Valid only for COLLECTIVE / MULTIPLEX operation; set in accordance with the total number of cars combined (single car = SIMPLEX).	SIMPLEX

FUNCTION F		ALLOWED VALUES AND MEANING		DEFAULT
F 40	LIFT NUMBER	- 0 ÷ 2 Valid only for MULTIPLEX operation. Identifies the car within a group: 0 = Car 1, 1 = Car 2, 2 = Car 3		0
F 41	ZONE TIME OUT	1 ÷ 5 minutes Valid only for MULTIPLEX operation. Indicates the maximum time one ZONE (one or more calls) can wait to be assigned to a car; after this time, the ZONE becomes a priority one.		5
F 42	EARLY DOOR OPENING	- NOT ACTIVE advanced opening not enabled. - ON SLOWING opening is controlled at the beginning of slowdown. An external safety circuit must provide the bypass of the door safety switches in the allowed door zone and enable the opening command at the suitable time. - AT FLOOR the opening command is given when the car reaches the door unlocking zone (USS or DSS engaged). An external safety circuit must provide the bypass of the door safety switches in the allowed door zone.		INACTIVE
F 43	MISSING FLOOR	- NONE - BOTTOM FLOOR - TOP FLOOR - OTHER CAR BOTTOM - OTHER CAR TOP Valid in case of "LAME" DUPLEX " operation i.e. in the particular case in which one or both cars cannot reach an end floor, served instead by the other car.		NONE
F 44	FIRE-FIGHTERS OPERATION	- NONE - EN81 – 72 - EN81 – 73	These functions, from F 44 to F 47 refer to the FIRE-FIGHTERS OPERATION. For a detailed explanation of the OPERATION and the FUNCTIONS, see Chapter 6.9 - FIRE-FIGHTERS OPERATION AS PER EN81-73. The operation according to EN81-72 is not implemented in this version of ELEMPU.	NONE
F 45	FIRE-FIGHTERS FLOOR 1	0 ÷ MAX F.		0
F 46		NOT USED		0
F 47	DOORS CLOSING PHASE 1	- NO - YES		NO
F 48	CAR LIGHT TIME UNIT	- SECONDS - MINUTES It allows you to change the unit of measurement for the time set in F 30 (1÷255 sec.), because turning car light off and on too frequently is not correct and 255 seconds could not be enough.		SECONDS
F 49	STAND-BY TIME	1 ÷ 255 minutes Allows controlling system's stand-by state. If the time is different from 0, when it elapses, in the absence of calls, with the car stopped and no particular circumstances are present such as INSPECTON, EMERGENCY, FIRE-FIGHTERS OPERATION…, output SBY is disabled. This output can be used to control the contactor that deactivates three-phase power supply to the entire panel and opens the safety series SC1, thus without losing car position. If a call button or command is activated, SBY output is immediately activated, bringing the board in normal operating condition.		0
F 50	RELEVELING MAX. TRAVEL TIME	0 ÷ 255 sec.		10

IMPORTANT
The functions with gray background are not implemented in this version of ELEMPU.

7.6 - SETTINGS

This functionality is not implemented in this version of the ELEMPU board.

7.7 - TEST

This feature allows you to perform a check on the outputs of ELEMPU boards, contact SMS for further information.

8 – EXAMPLES OF DIAGRAMS

In this chapter are given a few examples of diagrams:

8.1 - A.P.B. OPERATION – 2 SPEEDS

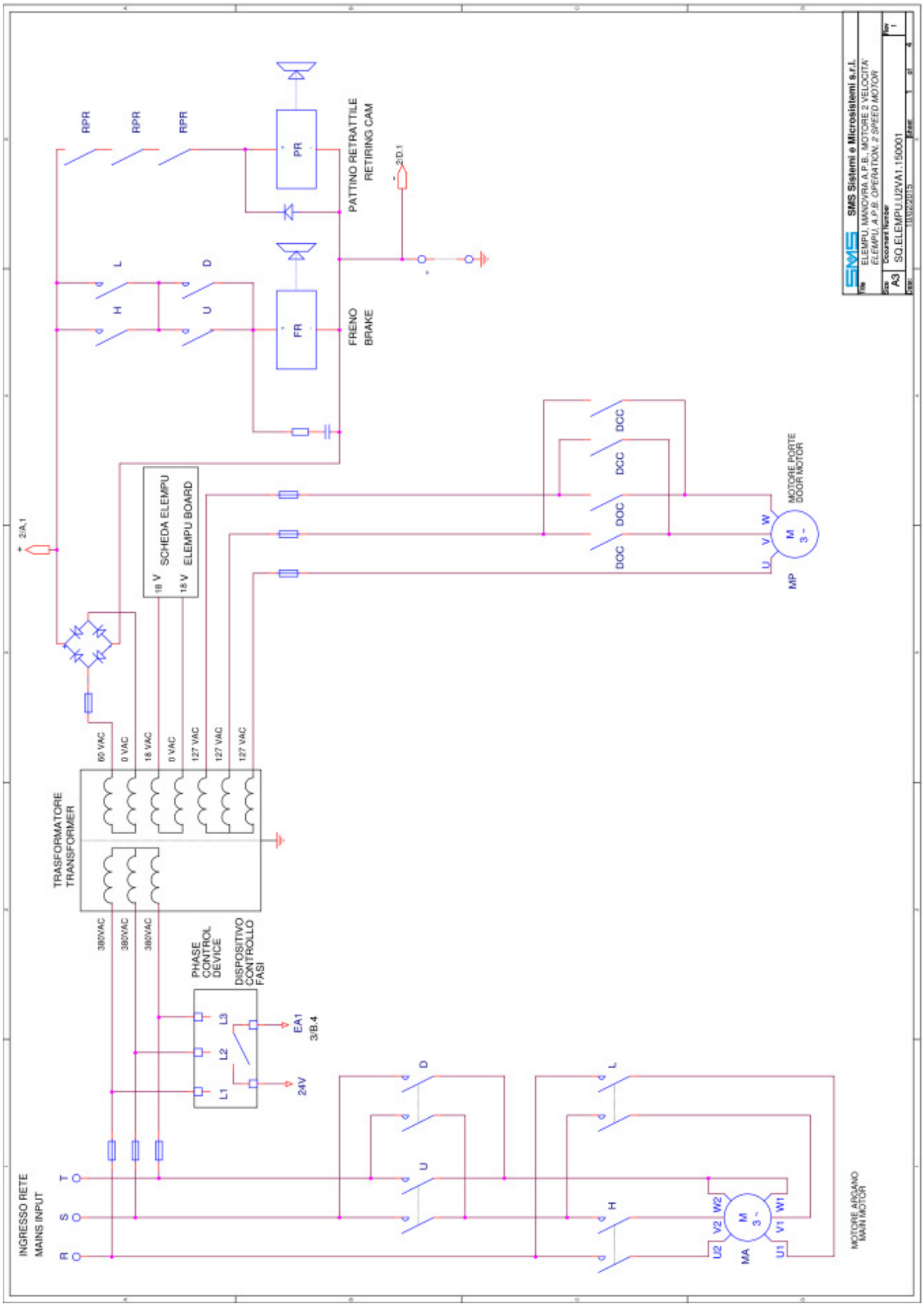
8.2 - A.P.B. OPERATION – HYDRAULIC

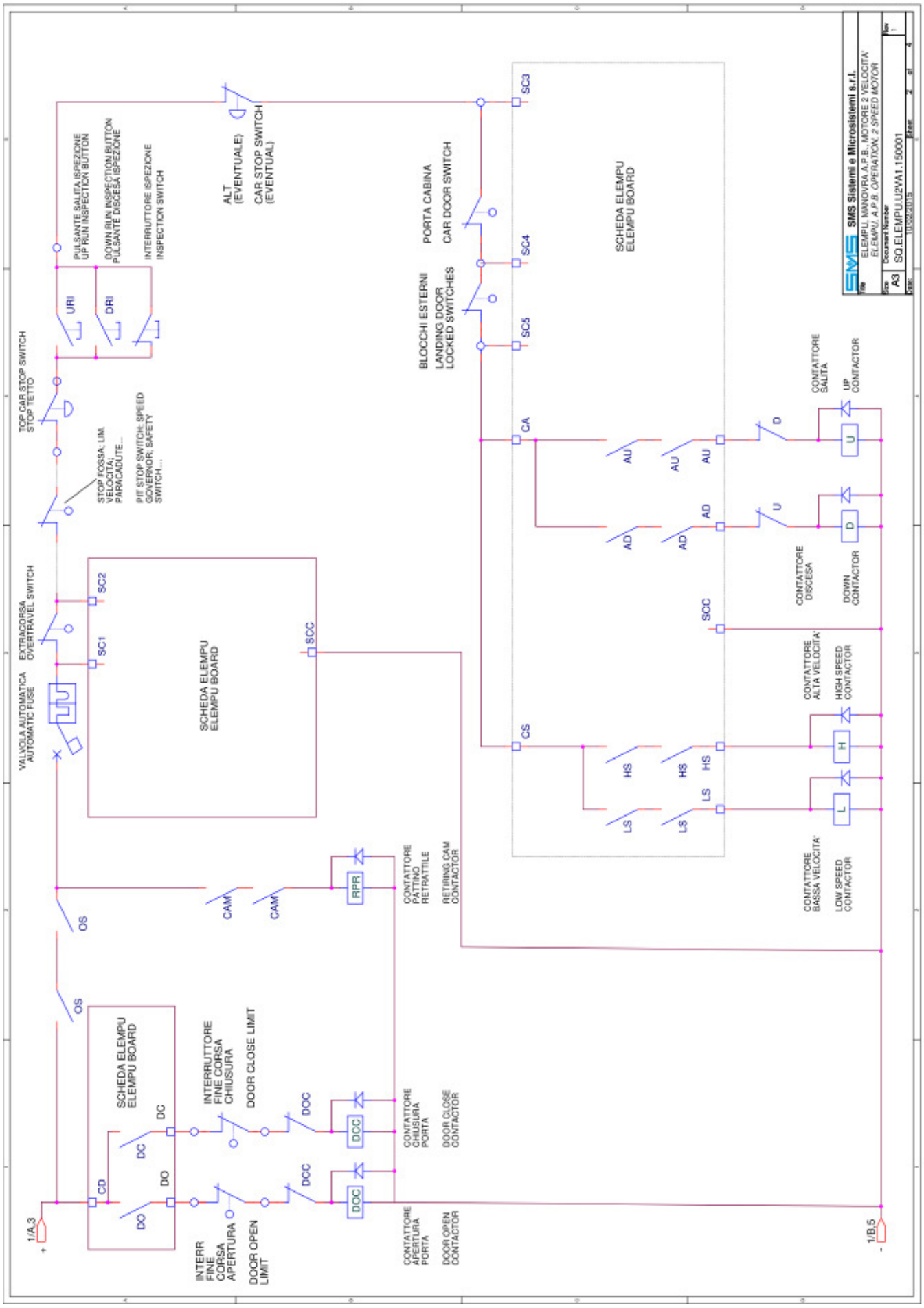
8.3 - FULL COLLECTIVE OPERATION – WITH TAKEDO-3VF NXP DRIVE

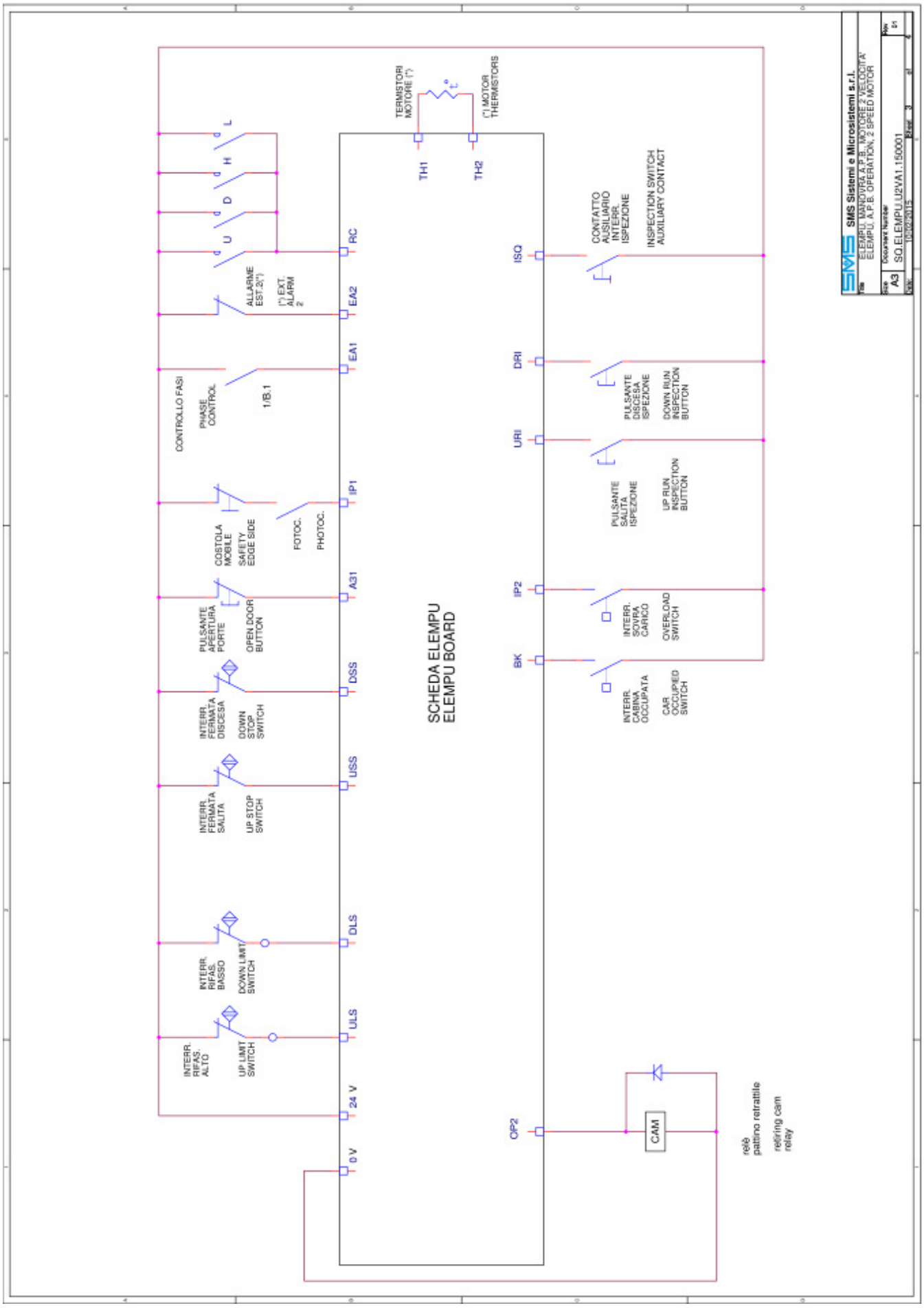
We have chosen to describe the doors motor, three-phase 125Vac, 50Hz type and an operating voltage of 48Vdc, but other solutions are also available, provided that they are compatible with the ELECTRICAL SPECIFICATIONS outlined in Chapter 3 of this Manual.

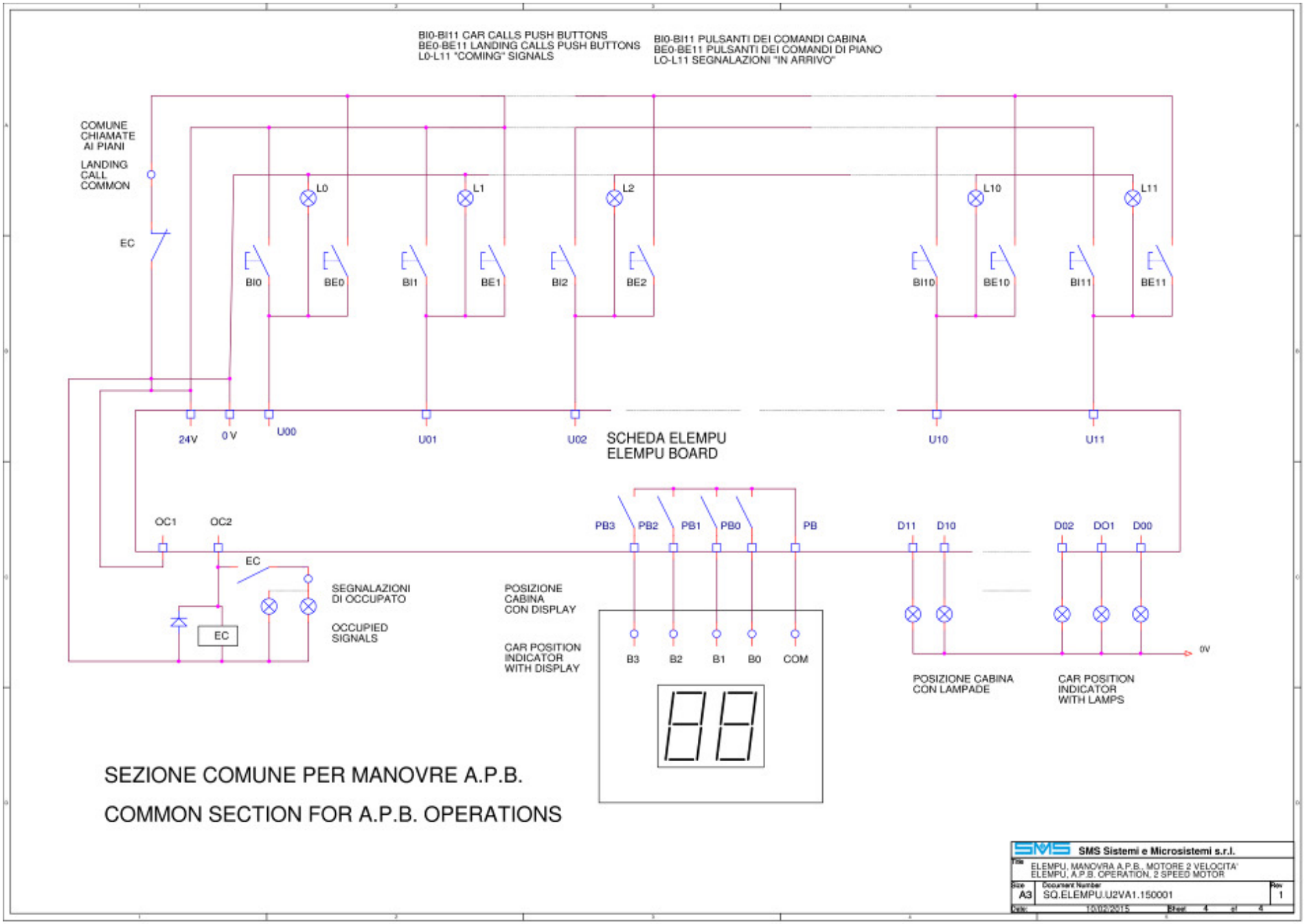
As a general rule, it is recommended to ALWAYS connect in parallel to the coils of relays, contactors, electromagnets, external to the board, a device for protection against surges, i.e. DIODES in the presence of DC voltage or directed voltage, or VARISTORS or RC FILTERS when it is important to quickly deenergize the equipment or in the presence of AC voltage.

8.1 - EXAMPLE OF DIAGRAM A.P.B. OPERATION – 2 SPEEDS




SMS Sistemi e Microsistemi s.r.l.
ELEMPU, MANOVRA A.P.B., MOTORE 2 VELOCITA'
ELEMPU, A.P.B. OPERATION, 2 SPEED MOTOR
A3
SQ.ELEMPU.U2VA1.150001
SCHEDA ELEMPU
ELEMPU BOARD
SCHEDA ELEMPU
ELEMPU BOARD
SCHEDA ELEMPU
ELEMPU BOARD
PULSANTE SALITA ISPEZIONE
UP RUN INSPECTION BUTTON
PULSANTE DISCESA ISPEZIONE
DOWN RUN INSPECTION BUTTON
INTERRUTTORE ISPEZIONE
INSPECTION SWITCH
ALT
(EVENTUALE)
CAR STOP SWITCH
(EVENTUAL)
PORTA CABINA
CAR DOOR SWITCH
BLOCCHI ESTERNI
LANDING DOOR
LOCKED SWITCHES
TOP CAR STOP SWITCH
STOP TETTO
STOP FOSSA, LIM.
VELOCITA',
PARACADUTE...
PIT STOP SWITCH, SPEED
GOVERNOR, SAFETY
SWITCH...
VALVOLA AUTOMATICA
AUTOMATIC FUSE
EXTRACORSA
OVERTRAVEL SWITCH
CONTATTORE
SALITA
UP
CONTACTOR
CONTATTORE
DISCESA
DOWN
CONTACTOR
CONTATTORE
ALTA VELOCITA'
HIGH SPEED
CONTACTOR
CONTATTORE
BASSA VELOCITA'
LOW SPEED
CONTACTOR
CONTATTORE
PATTINO
RETRATTILE
RETIRING CAM
CONTACTOR
CONTATTORE
CHIUSURA
PORTA
DOOR CLOSE
CONTACTOR
CONTATTORE
APERTURA
PORTA
DOOR OPEN
CONTACTOR
INTERRUTTORE
FINE CORSA
CHIUSURA
DOOR CLOSE LIMIT
INTERR
FINE
CORSA
APERTURA
DOOR OPEN
LIMIT
1/A.3
1/B.5


SMS Sistemi e Microsistemi s.r.l.
ELEMPU, MANOVRA A.P.E., MOTORE 2 VELOCITA'
ELEMPU, A.P.E. OPERATION, 2 SPEED MOTOR
A3
SQ.ELEMPU.U2VA1.150001
SCHEDA ELEMPU
ELEMPU BOARD
TERMISTORI MOTORE (*)
(*) MOTOR THERMISTORS
TH1
TH2
RC
EA2
EA1
IP1
A31
DSS
USS
DLS
ULS
24 V
0 V
ISQ
DRI
URI
IP2
BK
OP2
L
H
D
U
ALLARME EST.2(*)
(*) EXT. ALARM 2
CONTROLLO FASI
PHASE CONTROL
1/B.1
COSTOLA MOBILE
SAFETY EDGE SIDE
FOTOC.
PHOTOC.
PULSANTE APERTURA PORTE
OPEN DOOR BUTTON
INTERR. FERMATA DISCESA
DOWN STOP SWITCH
INTERR. FERMATA SALITA
UP STOP SWITCH
INTERR. RIFAS. BASSO
DOWN LIMIT SWITCH
INTERR. RIFAS. ALTO
UP LIMIT SWITCH
CONTATTO AUSILIARIO INTERR. ISPEZIONE
INSPECTION SWITCH AUXILIARY CONTACT
PULSANTE DISCESA ISPEZIONE
DOWN RUN INSPECTION BUTTON
PULSANTE SALITA ISPEZIONE
UP RUN INSPECTION BUTTON
INTERR. SOVRA. CARICO
OVERLOAD SWITCH
INTERR. CABINA OCCUPATA
CAR OCCUPIED SWITCH
CAM
relè
pattino retrattile
retiring cam
relay


BI0-BI11 CAR CALLS PUSH BUTTONS
BE0-BE11 LANDING CALLS PUSH BUTTONS
L0-L11 "COMING" SIGNALS
BI0-BI11 PULSANTI DEI COMANDI CABINA
BE0-BE11 PULSANTI DEI COMANDI DI PIANO
LO-L11 SEGNALAZIONI "IN ARRIVO"
COMUNE CHIAMATE AI PIANI
LANDING CALL COMMON
EC
L0
L1
L2
L10
L11
BI0
BE0
BI1
BE1
BI2
BE2
BI10
BE10
BI11
BE11
24V
0 V
U00
U01
U02
U10
U11
SCHEDA ELEMPU
ELEMPU BOARD
OC1
OC2
EC
EC
SEGNALAZIONI DI OCCUPATO
OCCUPIED SIGNALS
PB3
PB2
PB1
PB0
PB
POSIZIONE CABINA CON DISPLAY
CAR POSITION INDICATOR WITH DISPLAY
B3
B2
B1
B0
COM
D11
D10
D02
DO1
D00
0V
POSIZIONE CABINA CON LAMPADE
CAR POSITION INDICATOR WITH LAMPS
SEZIONE COMUNE PER MANOVRE A.P.B.
COMMON SECTION FOR A.P.B. OPERATIONS
SMS Sistemi e Microsistemi s.r.l.
ELEMPU, MANOVRA A.P.B., MOTORE 2 VELOCITA'
ELEMPU, A.P.B. OPERATION, 2 SPEED MOTOR
A3
SQ.ELEMPU.U2VA1.150001
1
19/02/2015

8.1.1 – SWITCHES AND MAGNETS FOR TRACTION LIFT SYSTEMS

ULS, DLS
Top and bottom floor
limit switches

USS
Up Stop Switch
(Down Slowing-down)

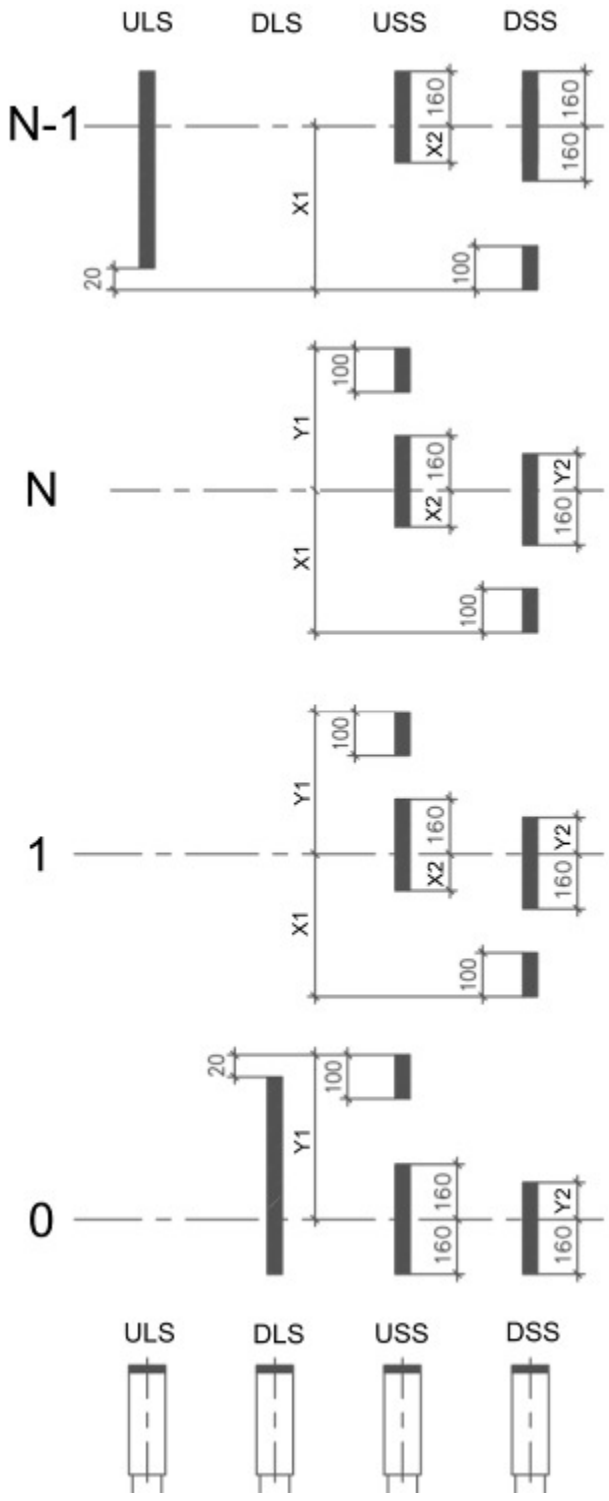
DSS
Down Stop Switch
(Up Slowing-down)

X1 = Up Slowing-down space

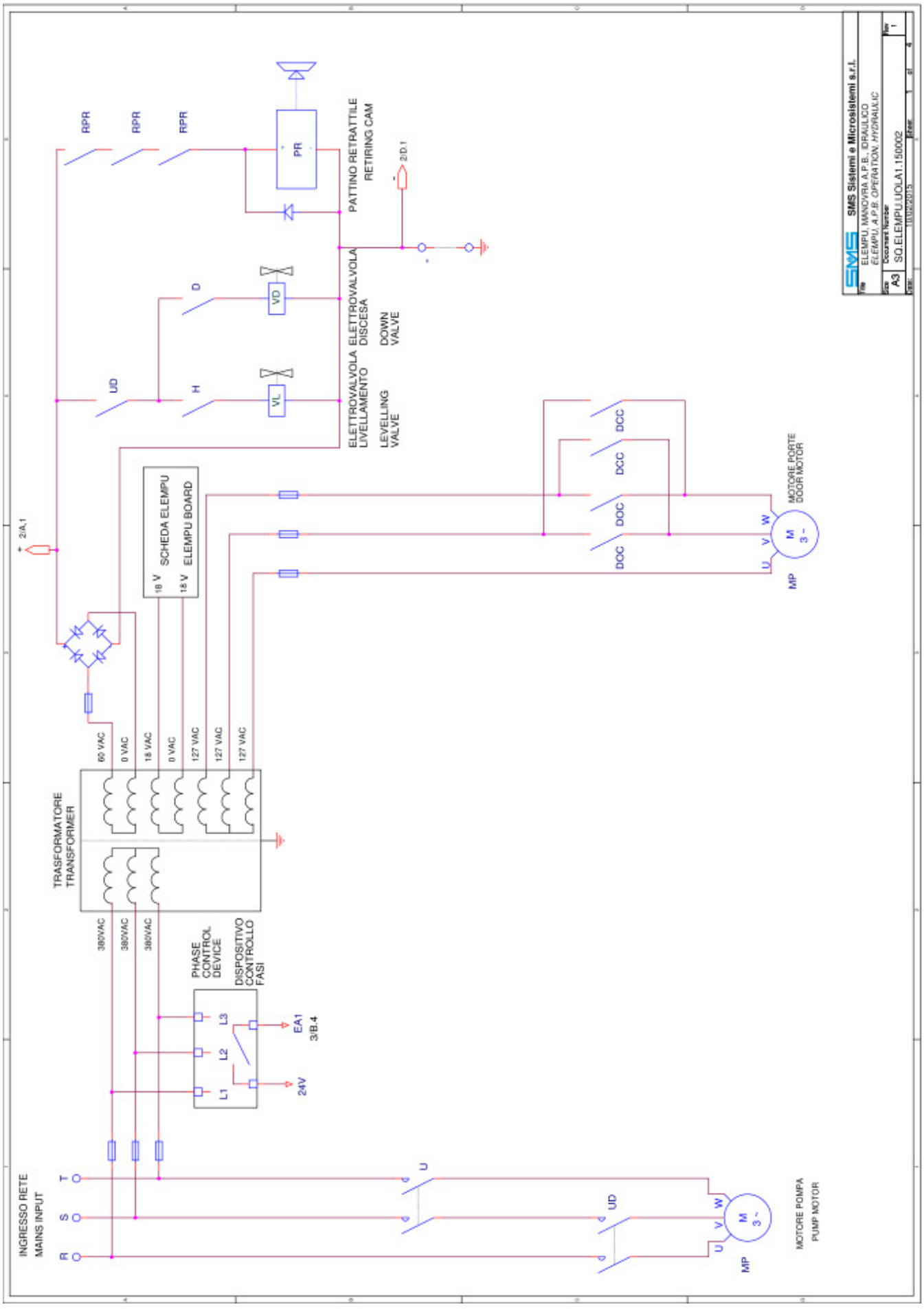
X2 = Up Stop space

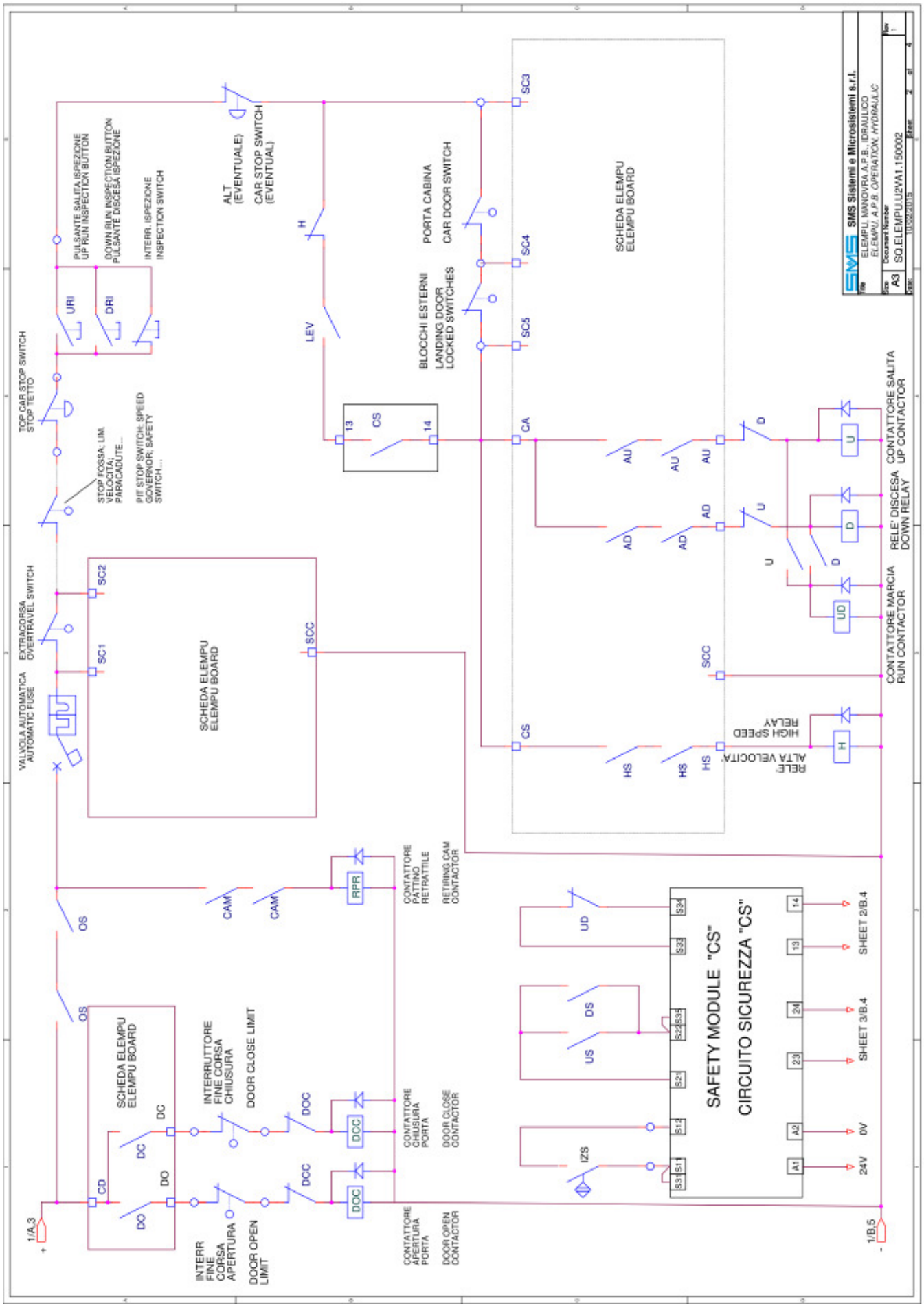
Y1 = Down Slowing-down space

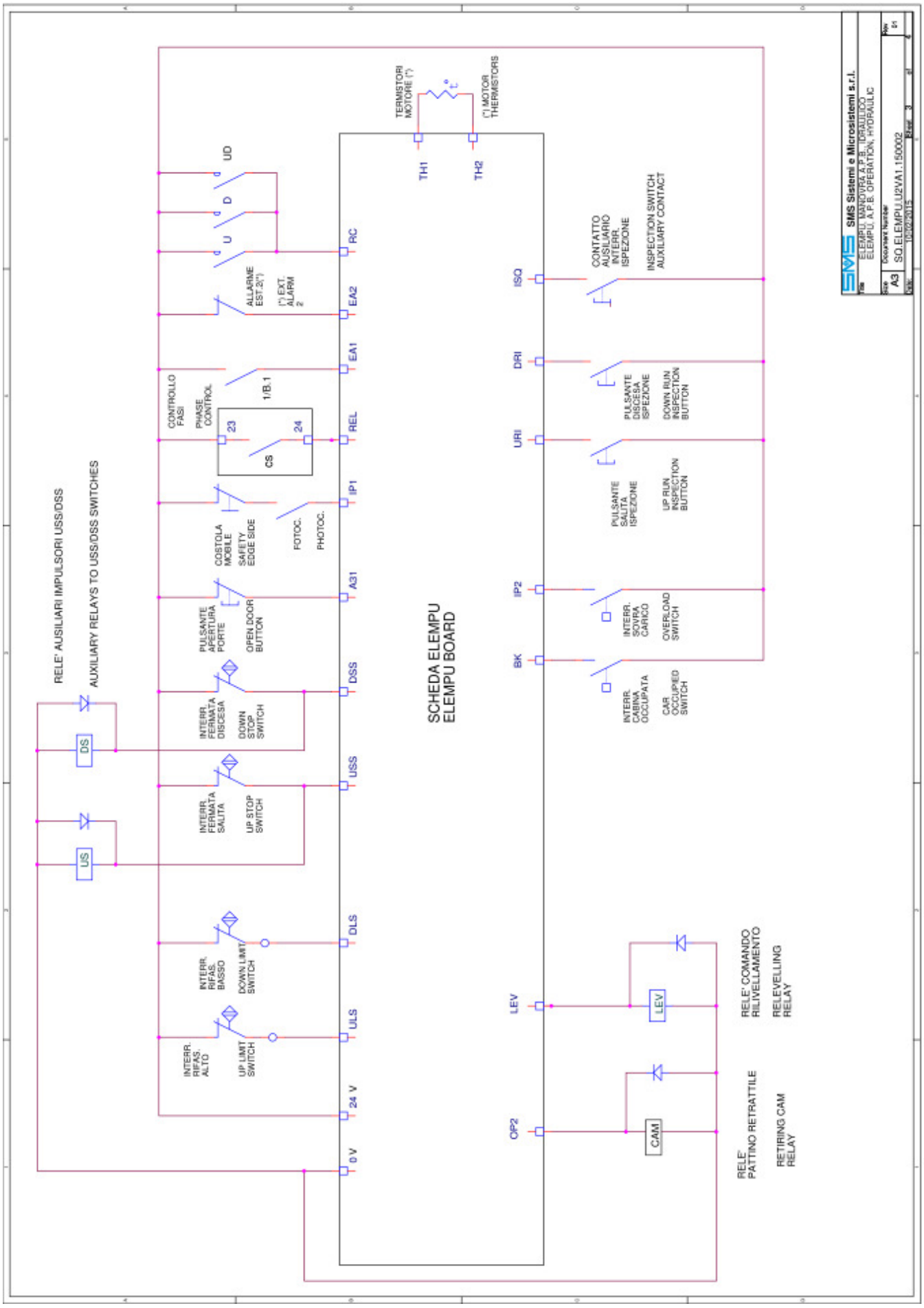
Y2 = Down Stop space



8.2 - EXAMPLE OF DIAGRAM A.P.B. OPERATION – HYDRAULIC




SMS Sistemi e Microsistemi s.r.l.
ELEMPU, MANOVRA A.P.B., IDRAULICO
ELEMPU, A.P.B. OPERATION, HYDRAULIC
A3
SQ.ELEMPU.U2VA1.150002
SCHEDA ELEMPU
ELEMPU BOARD
PORTA CABINA
CAR DOOR SWITCH
BLOCCHI ESTERNI
LANDING DOOR
LOCKED SWITCHES
ALT
(EVENTUALE)
CAR STOP SWITCH
(EVENTUAL)
PULSANTE SALITA ISPEZIONE
UP RUN INSPECTION BUTTON
PULSANTE DISCESA ISPEZIONE
DOWN RUN INSPECTION BUTTON
INTERR. ISPEZIONE
INSPECTION SWITCH
TOP CAR STOP SWITCH
STOP TETTO
STOP FOSSA, LIM.
VELOCITA',
PARACADUTE...
PIT STOP SWITCH, SPEED
GOVERNOR, SAFETY
SWITCH...
EXTRACORSA
OVERTRAVEL SWITCH
VALVOLA AUTOMATICA
AUTOMATIC FUSE
CONTATTORE SALITA
UP CONTACTOR
RELE' DISCESA
DOWN RELAY
CONTATTORE MARCIA
RUN CONTACTOR
RELE'
ALTA VELOCITA'
HIGH SPEED
RELAY
CONTATTORE
PATTINO
RETRATTILE
RETIRING CAM
CONTACTOR
CONTATTORE
CHIUSURA
PORTA
DOOR CLOSE
CONTACTOR
CONTATTORE
APERTURA
PORTA
DOOR OPEN
CONTACTOR
INTERRUTTORE
FINE CORSA
CHIUSURA
DOOR CLOSE LIMIT
INTERR
FINE
CORSA
APERTURA
DOOR OPEN
LIMIT
SAFETY MODULE "CS"
CIRCUITO SICUREZZA "CS"
SHEET 2/B.4
SHEET 3/B.4
24V
0V
1/A.3
1/B.5


SCHEDA ELEMPU
ELEMPU BOARD
RELE' AUSILIARI IMPULSORI USS/DSS
AUXILIARY RELAYS TO USS/DSS SWITCHES
TERMISTORI MOTORE (*)
(*) MOTOR THERMISTORS
TH1
TH2
UD
D
U
RC
EA2
EA1
REL
IP1
A31
DSS
USS
DLS
ULS
24 V
0 V
ISQ
DRI
URI
IP2
BK
LEV
OP2
ALLARME EST.2(*)
(*) EXT. ALARM 2
CONTROLLO FASI
PHASE CONTROL
1/B.1
23
24
CS
COSTOLA MOBILE
SAFETY EDGE SIDE
FOTOC.
PHOTOC.
PULSANTE APERTURA PORTE
OPEN DOOR BUTTON
INTERR. FERMATA DISCESA
DOWN STOP SWITCH
INTERR. FERMATA SALITA
UP STOP SWITCH
INTERR. RIFAS. BASSO
DOWN LIMIT SWITCH
INTERR. RIFAS. ALTO
UP LIMIT SWITCH
CONTATTO AUSILIARIO INTERR. ISPEZIONE
INSPECTION SWITCH AUXILIARY CONTACT
PULSANTE DISCESA ISPEZIONE
DOWN RUN INSPECTION BUTTON
PULSANTE SALITA ISPEZIONE
UP RUN INSPECTION BUTTON
INTERR. SOVRA. CARICO
OVERLOAD SWITCH
INTERR. CABINA OCCUPATA
CAR OCCUPIED SWITCH
RELE' COMANDO RILIVELLAMENTO
RELEVELLING RELAY
RELE' PATTINO RETRATTILE
RETIRING CAM RELAY
DS
US
CAM
SMS Sistemi e Microsistemi s.r.l.
ELEMPU, MANOVRA A.P.E. IDRAULICO
ELEMPU, A.P.E. OPERATION, HYDRAULIC
A3
SQ.ELEMPU.U2VA1.150002

8.2.1 – SWITCHES AND MAGNETS FOR HYDRAULIC LIFT SYSTEM

Compared to the traction lift systems (see Fig. 9), an added switch is needed, for the control of the releveling zone through a safety circuit (IZS).
This switch must have an N.O. contact (closed at floor).

ULS, DLS
Top and bottom floor limit switches

USS
Up Stop Switch
(Down Slowing-down)

DSS
Down Stop Switch
(Up Slowing-down)

IZS
Door zone switch

X1 = Up Slowing-down space

X2 = Up Stop space

Y1 = Down Slowing-down space

Y2 = Down Stop space

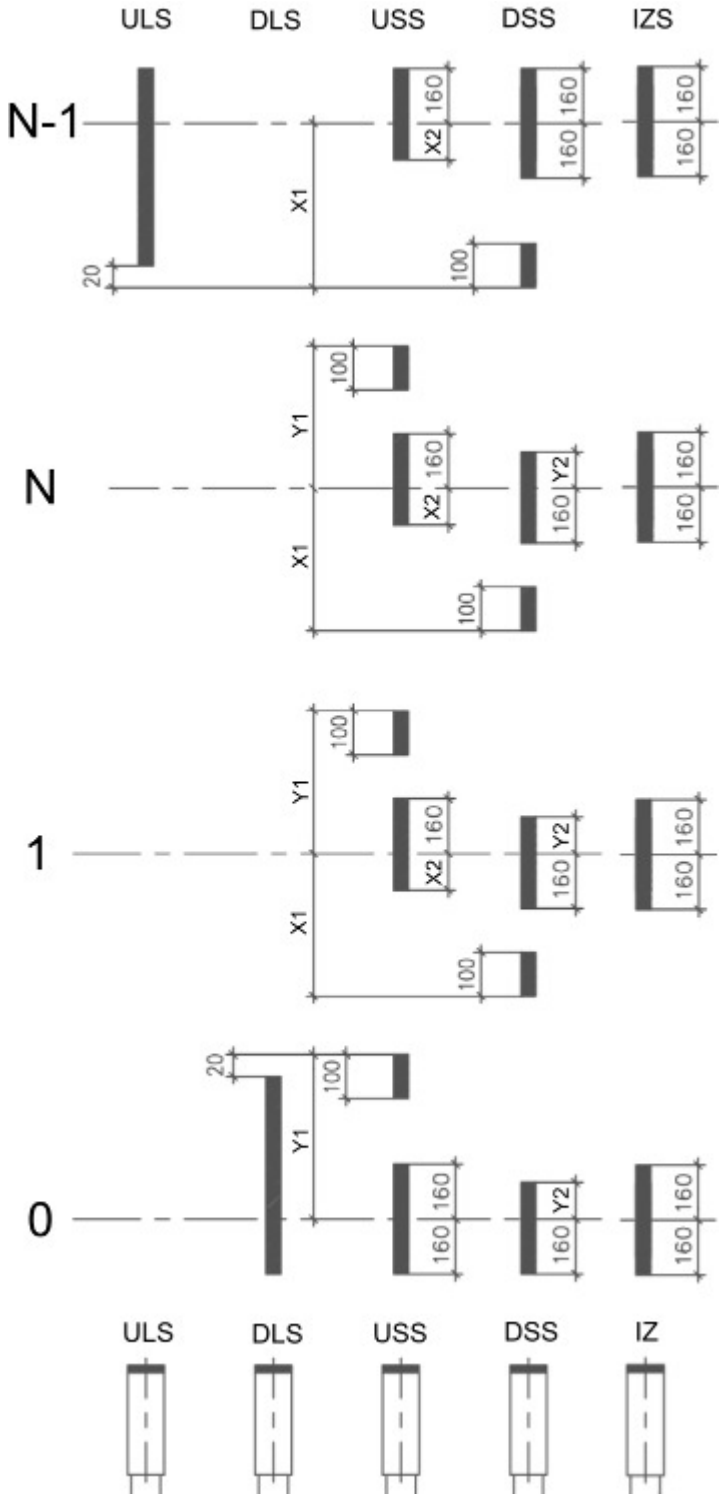
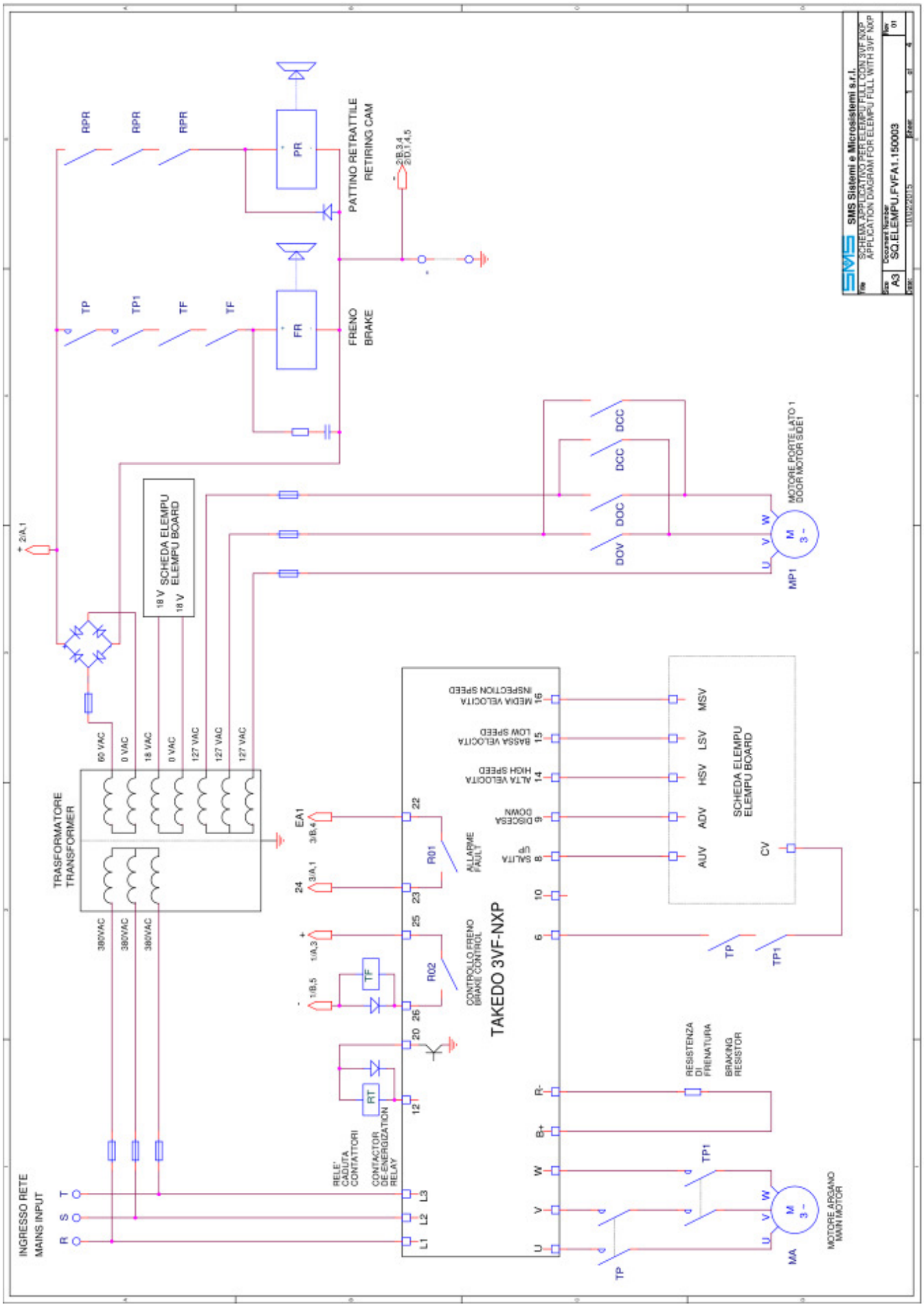
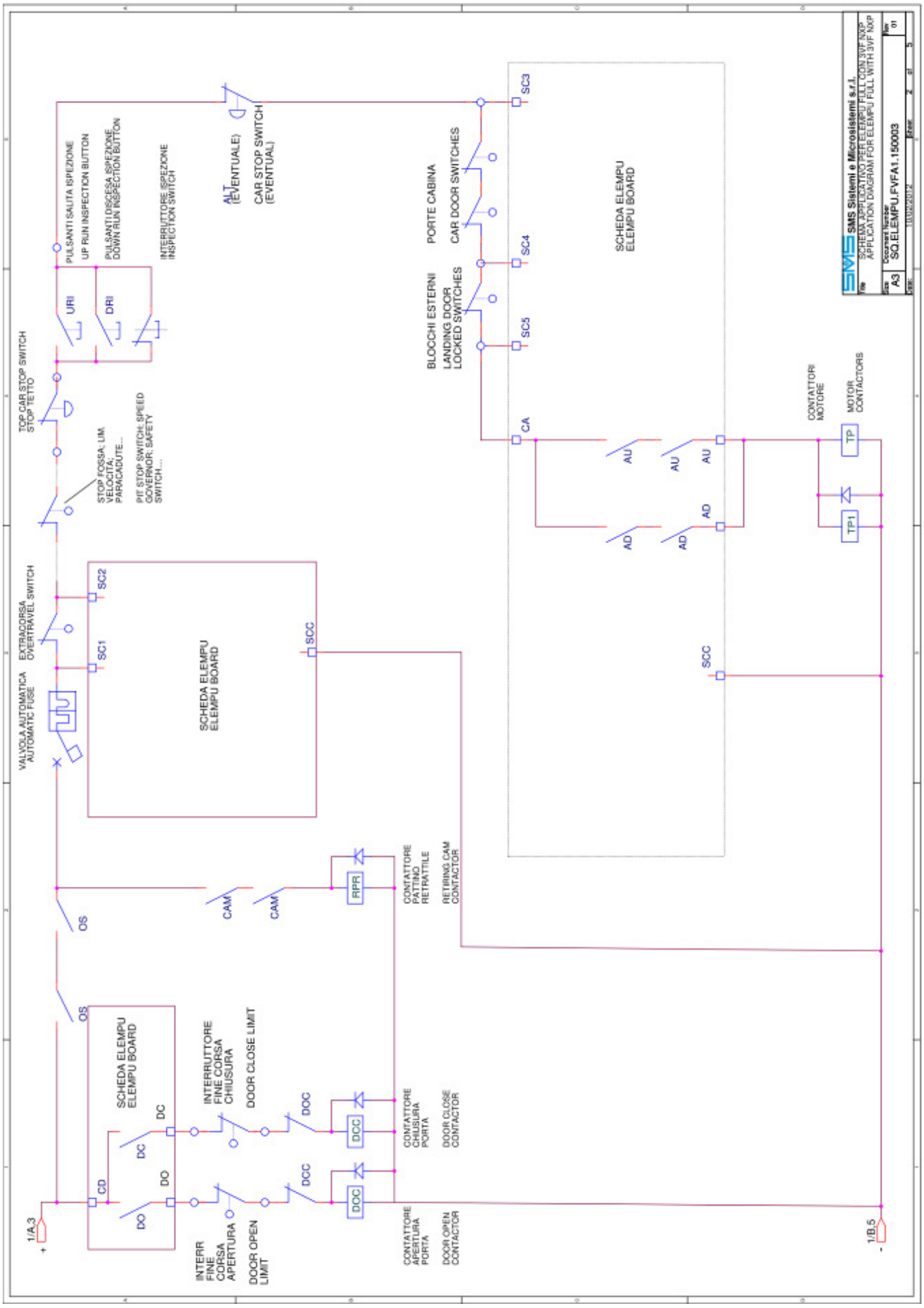
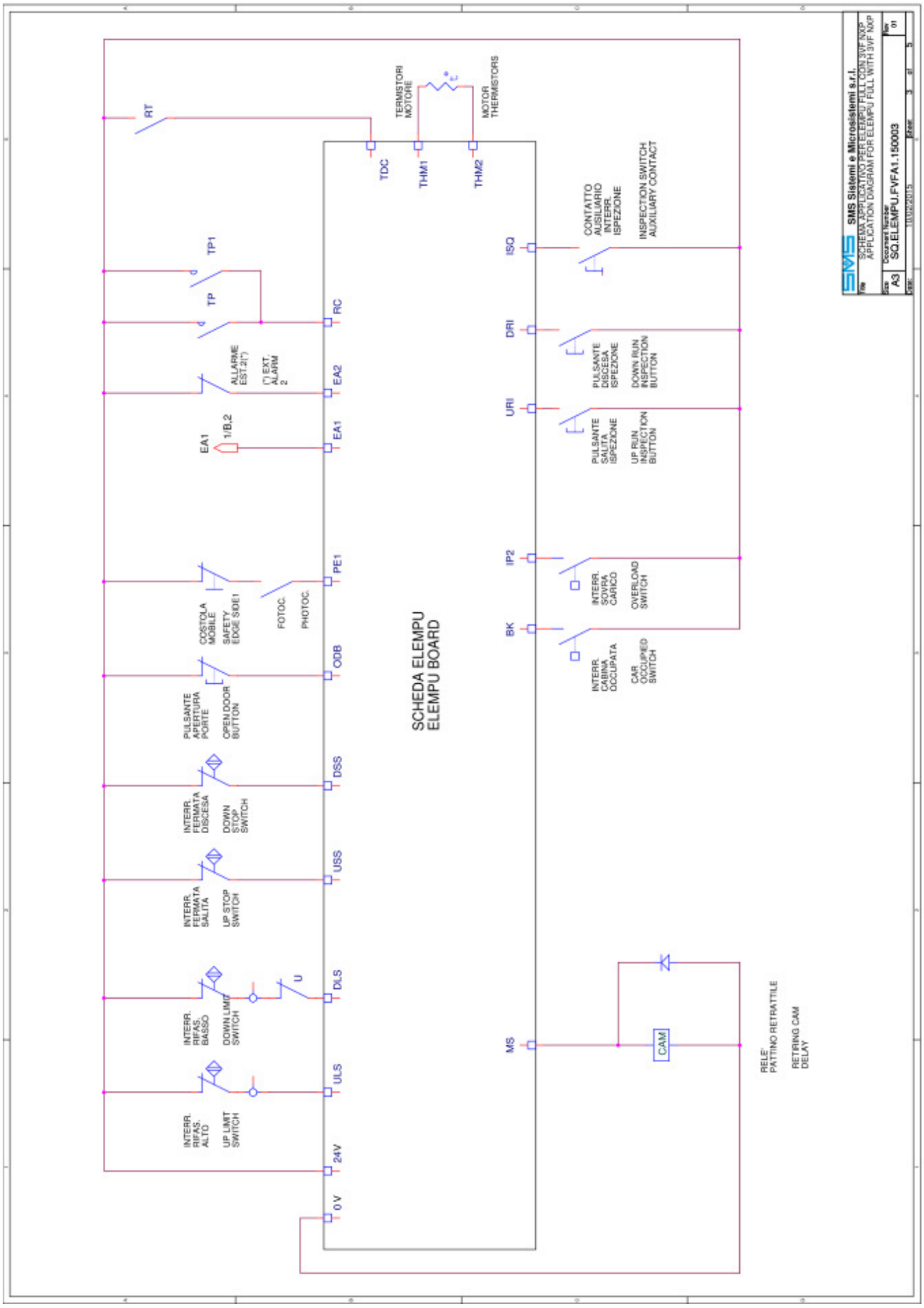


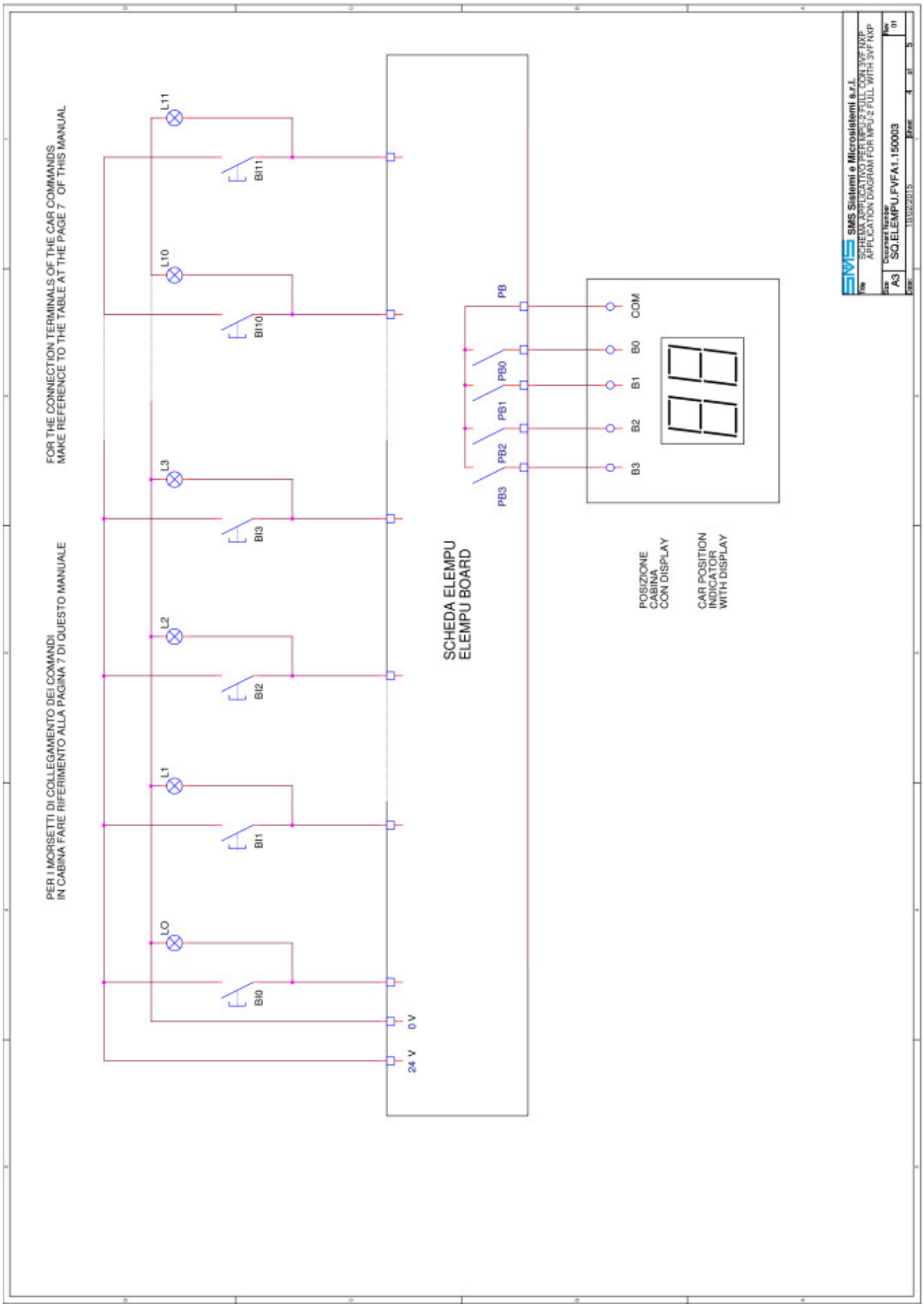
Fig. 12

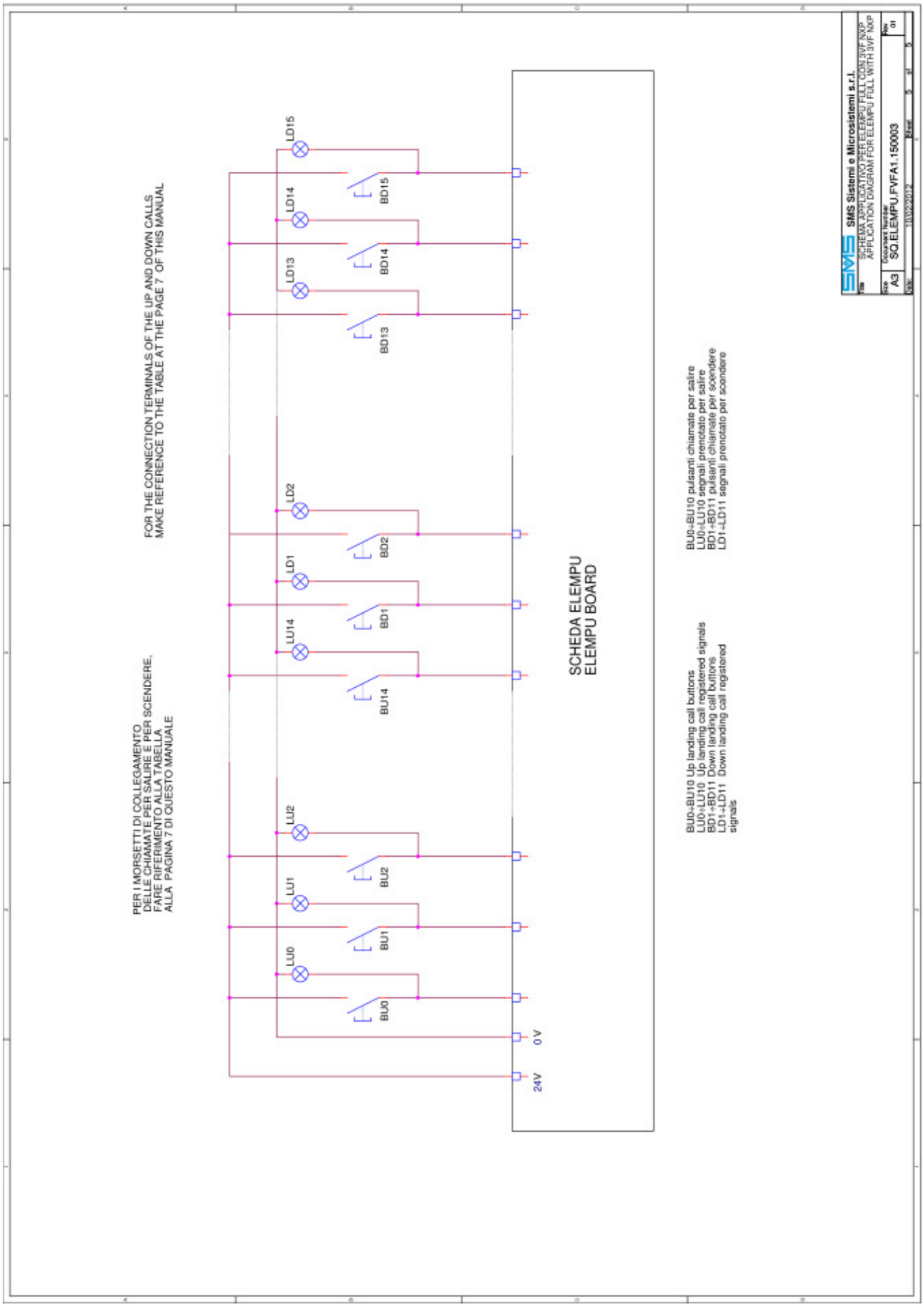
8.3 - EXAMPLE OF DIAGRAM FULL COLLECTIVE OPERATION – WITH TAKEDO-3VF NXP DRIVE



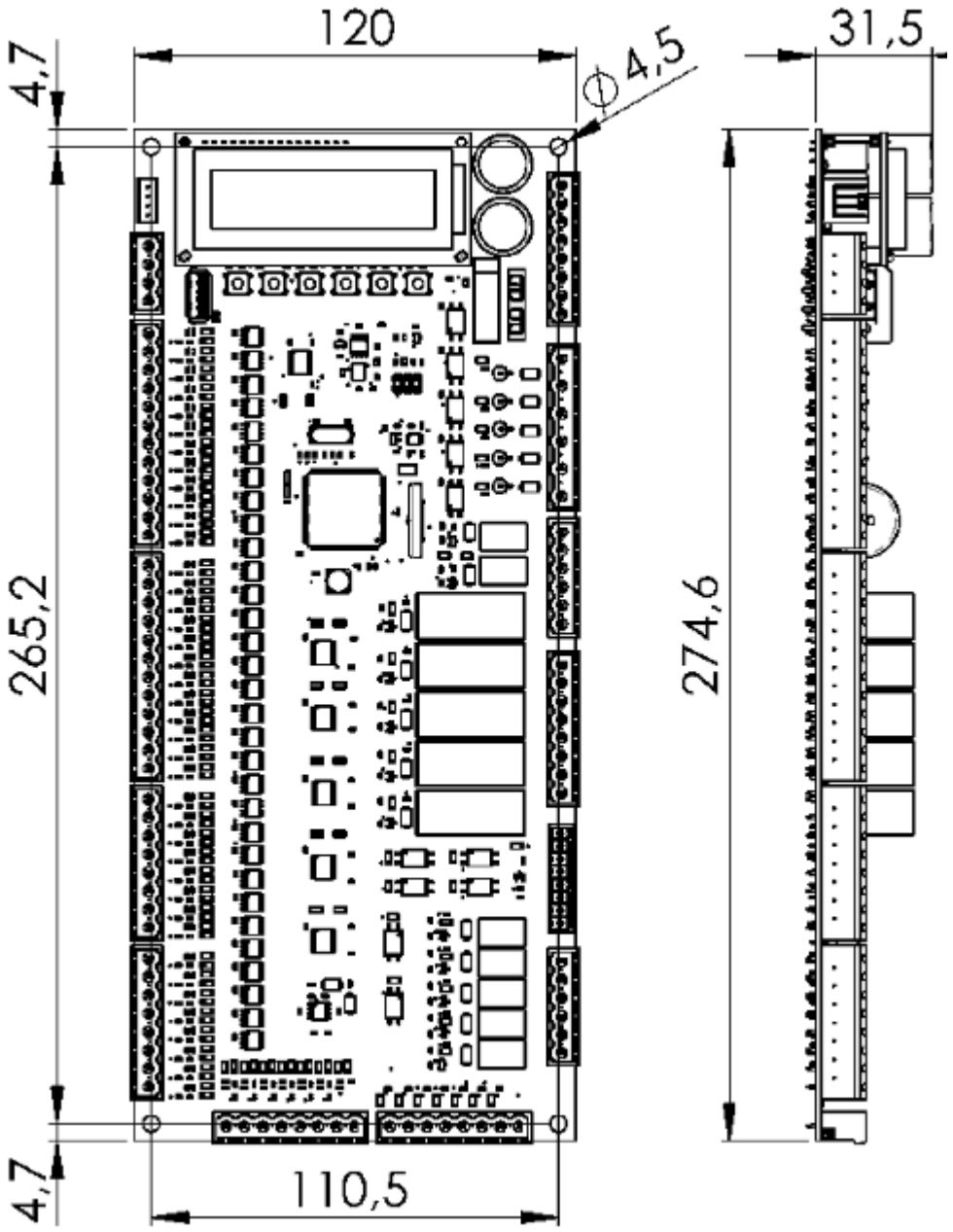

SMS Sistemi e Microsistemi s.r.l.
SCHEMA APPLICATIVO PER ELEMPU FULL CON 3VF NXP
APPLICATION DIAGRAM FOR ELEMPU FULL WITH 3VF NXP
A3
SQ.ELEMPU.FVFA1.150003
1/A.3
1/B.5
SCHEDA ELEMPU
ELEMPU BOARD
SC1
SC2
SC3
SC4
SC5
SCC
CA
CD
DC
DO
DOC
OS
CAM
RPR
AU
AD
TP
TP1
URI
DRI
PULSANTI SALITA ISPEZIONE
UP RUN INSPECTION BUTTON
PULSANTI DISCESA ISPEZIONE
DOWN RUN INSPECTION BUTTON
INTERRUTTORE ISPEZIONE
INSPECTION SWITCH
ALT.
(EVENTUALE)
CAR STOP SWITCH
(EVENTUAL)
TOP CAR STOP SWITCH
STOP TETTO
STOP FOSSA, LIM.
VELOCITA',
PARACADUTE...
PIT STOP SWITCH, SPEED
GOVERNOR, SAFETY
SWITCH...
VALVOLA AUTOMATICA
AUTOMATIC FUSE
EXTRACORSA
OVERTRAVEL SWITCH
PORTE CABINA
CAR DOOR SWITCHES
BLOCCHI ESTERNI
LANDING DOOR
LOCKED SWITCHES
CONTATTORI
MOTORE
MOTOR
CONTACTORS
CONTATTORE
PATTINO
RETRATTILE
RETIRING CAM
CONTACTOR
INTERRUTTORE
FINE CORSA
CHIUSURA
DOOR CLOSE LIMIT
CONTATTORE
CHIUSURA
PORTA
DOOR CLOSE
CONTACTOR
INTERR
FINE
CORSA
APERTURA
DOOR OPEN
LIMIT
CONTATTORE
APERTURA
PORTA
DOOR OPEN
CONTACTOR


SMS Sistemi e Microsistemi s.r.l.
SCHEMA APPLICATIVO PER ELEMPU FULL CON 3VF NXP
APPLICATION DIAGRAM FOR ELEMPU FULL WITH 3VF NXP
Document Number
SQ.ELEMPU.FVFA1.150003
A3
SCHEDA ELEMPU
ELEMPU BOARD
RT
TDC
TERMISTORI MOTORE
MOTOR THERMISTORS
THM1
THM2
TP1
TP
RC
ALLARME EST.2(1°)
(1) EXT. ALARM 2
EA2
EA1
1/B.2
EA1
COSTOLA MOBILE
SAFETY EDGE SIDE1
FOTOC.
PHOTOC.
PE1
ODB
PULSANTE APERTURA PORTE
OPEN DOOR BUTTON
INTERR. FERMATA DISCESA
DOWN STOP SWITCH
DSS
INTERR. FERMATA SALITA
UP STOP SWITCH
USS
INTERR. RIFAS. BASSO
DOWN LIMIT SWITCH
DLS
INTERR. RIFAS. ALTO
UP LIMIT SWITCH
ULS
24V
0 V
ISQ
CONTATTO AUSILIARIO INTERR. ISPEZIONE
INSPECTION SWITCH AUXILIARY CONTACT
DRI
PULSANTE DISCESA ISPEZIONE
DOWN RUN INSPECTION BUTTON
URI
PULSANTE SALITA ISPEZIONE
UP RUN INSPECTION BUTTON
IP2
INTERR. SOVRA CARICO
OVERLOAD SWITCH
BK
INTERR. CABINA OCCUPATA
CAR OCCUPIED SWITCH
MS
CAM
RELE' PATTINO RETRATTILE
RETIRING CAM DELAY


SMS Sistemi e Microsistemi s.r.l.
SCHEMA APPLICATIVO PER MPU-3 FULL CON SW NXP
APPLICATION DIAGRAM FOR MPU-2 FULL WITH SW NXP
Document Number
SQ.ELEMPU.FVFA1.150003
A3
Rev 01
10/02/2015
Sheet 4 of 5
FOR THE CONNECTION TERMINALS OF THE CAR COMMANDS
MAKE REFERENCE TO THE TABLE AT THE PAGE 7 OF THIS MANUAL
PER I MORSETTI DI COLLEGAMENTO DEI COMANDI
IN CABINA FARE RIFERIMENTO ALLA PAGINA 7 DI QUESTO MANUALE
L11
BI11
L10
BI10
L3
BI3
L2
BI2
L1
BI1
L0
BI0
0 V
24 V
SCHEDA ELEMPU
ELEMPU BOARD
PB
PB0
PB1
PB2
PB3
COM
B0
B1
B2
B3
POSIZIONE
CABINA
CON DISPLAY
CAR POSITION
INDICATOR
WITH DISPLAY


SMS Sistemi e Microsistemi s.r.l.
SCHEMA APPLICATIVO PER ELEMPU FULL CON 3VF NXP
APPLICATION DIAGRAM FOR ELEMPU FULL WITH 3VF NXP
Size A3
Document Number SQ.ELEMPU.FVFA1.150003
Rev 01
Date 10/09/2012
Sheet 5 of 5
FOR THE CONNECTION TERMINALS OF THE UP AND DOWN CALLS
MAKE REFERENCE TO THE TABLE AT THE PAGE 7 OF THIS MANUAL
PER I MORSETTI DI COLLEGAMENTO
DELLE CHIAMATE PER SALIRE E PER SCENDERE,
FARE RIFERIMENTO ALLA TABELLA
ALLA PAGINA 7 DI QUESTO MANUALE
LD15
LD14
LD13
LD2
LD1
LU14
LU2
LU1
LU0
BD15
BD14
BD13
BD2
BD1
BU14
BU2
BU1
BU0
0 V
24V
SCHEDA ELEMPU
ELEMPU BOARD
BU0÷BU10 Up landing call buttons
LU0÷LU10 Up landing call registered signals
BD1÷BD11 Down landing call buttons
LD1÷LD11 Down landing call registered signals
BU0÷BU10 pulsanti chiamate per salire
LU0÷LU10 segnali prenotato per salire
BD1÷BD11 pulsanti chiamate per scendere
LD1÷LD11 segnali prenotato per scendere

9 – DIMENSIONS AND FASTENING



For further clarifications and suggestions please contact:

SMS SISTEMI e MICROSISTEMI s.r.l. (SASSI HOLDING group)
Via Guido Rossa, 46/48/50 Loc. Crespellano 40053 Valsamoggia BO - ITALY
Phone: +39 051 969037 Fax : +39 051 969303 Technical Support: +39 051 6720710
E-mail: sms@sms.bo.it website : www.sms-lift.com